



## **DEPARTMENT OF THE INTERIOR**

### **Fish and Wildlife Service**

#### **50 CFR Part 17**

**[Docket No. FWS–R7–ES–2009–0049; MO 9221050083-B2]**

**RIN 1018–AY 43**

### **Endangered and Threatened Wildlife and Plants; Listing the British Columbia Distinct Population Segment of the Queen Charlotte Goshawk Under the Endangered Species Act**

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Final rule.

**SUMMARY:** We, the U.S. Fish and Wildlife Service, hereby list the British Columbia distinct population segment (DPS) of the Queen Charlotte goshawk (*Accipiter gentilis laingi*) as threatened under the Endangered Species Act of 1973, as amended (Act). This final rule implements the Federal protections provided by the Act for this subspecies in British Columbia, Canada, on

Vancouver Island and the surrounding smaller islands, the Queen Charlotte Islands, and the coastal mainland and adjacent islands west of the crest of the Coast Mountains. Because the British Columbia DPS is entirely outside the United States, we are not designating critical habitat.

**DATES:** This final rule becomes effective [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** This final rule is available on the Internet at <http://www.regulations.gov> at Docket No. FWS–R7–ES–2009–0049 and comments and materials received, as well as supporting documentation used in the preparation of this rule, will be available for public inspection, by appointment, during normal business hours at: U.S. Fish and Wildlife Service, U.S. Fish and Wildlife Service, 4401 N. Fairfax Drive, Suite 400, Arlington, VA 22203.

**FOR FURTHER INFORMATION CONTACT:** Steve Brockmann, Deputy Field Supervisor, Juneau Fish and Wildlife Field Office, 3000 Vintage Blvd. Suite 201, Juneau, AK 99801; telephone (907) 780–1181; fax (907) 586–7154.

**SUPPLEMENTARY INFORMATION:**

**Background**

*Previous Agency Action*

On May 9, 1994, the U.S. Fish and Wildlife Service (Service) received a petition from eight conservation groups and two individuals to list the Queen Charlotte goshawk as endangered, and to designate critical habitat. Logging of old-growth forest, where the bird nests and forages, was the primary threat identified. On August 26, 1994, we published our 90-day finding that the petition presented substantial information indicating that listing may be warranted, opened a public comment period, and initiated a status review to determine whether listing the subspecies was warranted (59 FR 44124).

Following our status review, we determined that listing the Queen Charlotte goshawk as threatened or endangered under the Act was not warranted and published our finding in the **Federal Register** on June 29, 1995 (60 FR 33784). We expressed concern for long-term viability of the bird under the existing management plan for the Tongass National Forest (covering about 80 percent of Southeast Alaska), but we acknowledged that a new management plan was being drafted, and the new plan was expected to provide improved protection for the subspecies. The June 1995 “not warranted” finding was challenged in the U.S. District Court for the District of Columbia, in a suit filed on November 17, 1995, by 8 of the original 10 petitioners, plus 2 additional conservation organizations and 1 additional individual. The district court granted summary judgment for the plaintiffs on September 25, 1996, holding that the Service should

not have relied on “possible future actions” described in a draft revision to the 1979 Tongass Land Management Plan (TLMP) “to provide sanctuary for the goshawk.” The decision was remanded to the Service with instructions to make a listing determination based on the existing 1979 TLMP (*Southwest Center for Biological Diversity v. Babbitt*, 939 F. Supp. 49 (D.D.C. 1996)).

On September 4, 1997, we published our new finding that listing the Queen Charlotte goshawk as threatened or endangered was not warranted (62 FR 46710). In 1998, this finding was challenged in the same district court, and on July 20, 1999, the finding was remanded to us, with instructions to provide a more accurate and reliable population estimate, and to consider a 1999 revision of the 1997 TLMP. We appealed the district court’s decision to the Court of Appeals for the District of Columbia. The court of appeals agreed with the Service and remanded the case back to the district court (*Southwest Center for Biological Diversity v. Babbitt*, 215 F. 3d 58 (D.C.C. 2000)).

On July 29, 2002, a district court magistrate issued recommended findings that: (1) We had fulfilled our obligation to use the best scientific data available; (2) the “not warranted” determination was entitled to deference; (3) our determination that the Queen Charlotte goshawk would persist in Alaska and the Queen Charlotte Islands was not unreasonable; (4) Vancouver Island, which constituted one-third of the subspecies’ geographic range, was a “significant portion” of the subspecies’ range; and (5) our failure to make a specific finding as

to the conservation status of the subspecies on Vancouver Island was a material omission. The magistrate recommended a remand to the Service to make a finding as to whether the Queen Charlotte goshawk should be listed based on its conservation status on Vancouver Island (*Southwest Center for Biological Diversity v. Norton*, No. 98-934, 2002 U.S. Dist. LEXIS 13661, (D.D.C. July 29, 2002)).

On May 24, 2004, a district court judge issued an order that adopted the magistrate's recommendations, except for the magistrate's finding that Vancouver Island constituted a significant portion of the range for the Queen Charlotte goshawk. Instead, the district court directed the Service upon remand to reconsider and explain any determination as to whether or not Vancouver Island is a significant portion of the subspecies' range, and assess whether the Queen Charlotte goshawk is endangered or threatened on Vancouver Island (*Southwest Center for Biological Diversity v. Norton*, No. 98-0934 (D.D.C. May 24, 2004)).

On November 8, 2007, we published our "Response to Court on Significant Portion of the Range, and Evaluation of Distinct Population Segments, for the Queen Charlotte Goshawk" (72 FR 63123) (Response to Court). In the Response to Court, we found that Vancouver Island was a significant portion of the Queen Charlotte goshawk's range, that Southeast Alaska and British Columbia each supported distinct population segments, and that listing was warranted for the British Columbia DPS, but not for the Southeast Alaska DPS.

On November 3, 2009, we published a proposed rule to list the Queen Charlotte goshawk as threatened on Vancouver Island and the surrounding, smaller islands, and on the mainland coast of British Columbia. We also proposed to list the subspecies as endangered on the Queen Charlotte Islands (74 FR 56757). Upon publication, we initiated a 60-day public comment period, and requested information and comments, particularly on threats to the subspecies. We also solicited peer reviews from individuals with expertise in Queen Charlotte goshawk biology and/or forest management in British Columbia.

#### *Queen Charlotte Goshawk Biology and Habitat*

The Queen Charlotte goshawk is a comparatively small, dark subspecies of northern goshawk (*Accipiter gentilis*) that nests and forages in the temperate, rainforest-dominated archipelagos and coastal mainland of Southeast Alaska and British Columbia. Taxonomic treatments and reviews have generally accepted the Queen Charlotte goshawk (*A. g. laingi*) as distinct from the subspecies found across most of North America (*A. g. atricapillus*) (reviewed in USFWS 2007a, pp. 12–13). For purposes of the Species at Risk Act, the Government of Canada has dropped the common name “Queen Charlotte goshawk” in favor of “Northern Goshawk *laingi* subspecies” (Canada Gazette II, 2005:139(2):p. 79). In British Columbia, the recovery team working on the subspecies has adopted this protocol (NGRT 2008, p. vii).

Natural history and threats to the subspecies are described in detail in our status reviews (USFWS 2007; USFWS 2010) and evaluated in our most recent finding, published in the **Federal Register** on November 8, 2007 (72 FR 63123). Below, we briefly summarize key aspects of the Queen Charlotte goshawk's natural history.

Goshawks typically nest and forage in old-growth forest, but use mature second-growth (previously harvested, regenerating stands that have developed adequate structure) for either purpose where old-growth forest is limited (Titus *et al.* 1994, pp. 19–24; Iverson *et al.* 1996, pp. 27–40; McClaren and Pendergast 2003, pp. 4–6). Non-forested land, recently clear-cut areas, and young second-growth stands are avoided (Iverson *et al.* 1996, pp. 27–40).

“Old growth” or “old forest” refers to a structural stage of forest characterized by several age classes of trees, including dominant trees that have reached the maximum size typical for the site, accumulations of dead, dying, and decaying trees and logs, and younger trees growing in gaps between the dominant trees. Such stands are typically over 250 years old within the range of the Queen Charlotte goshawk, and have not been previously harvested.

Forest regeneration following timber harvest usually results in dense second-growth stands that may support populations of some prey species, but

research across North America suggests that goshawks avoid these habitats, presumably because they are too dense for the hawks to effectively hunt (Iverson *et al.* 1996, p. 64; DeStefano and McCloskey 1997, p. 38; Beier and Drennan 1997, p. 570; reviewed by Greenwald *et al.* 2005, pp. 125–126 and USFWS 2007, pp. 62–67). Goshawks, however, have been observed hunting in 10–20-year-old second-growth stands by flying above the forest canopy (Bloxtton 2002, pp. 42–43).

As second-growth stands approach economic maturity, the forest structure develops adequately to allow goshawks to nest and forage below the canopy. Second growth reaches economic maturity when its growth rate begins to slow. Trees of this age typically have not reached maximum size. Canopies of these stands are usually uniformly dense unless the stand was harvested in a multi-age system or has been thinned. We refer to such stands as “mature,” or “mature second growth.” In this document, “young second growth” refers to second growth that has not yet reached economic maturity.

Mature forest with structure suitable for goshawk nesting and foraging may develop as early as 45 to 50 years following harvest on the most productive sites in the southern portion of the Queen Charlotte goshawk’s range (Doyle 2004, pp. 27–28; McClaren 2003a, p. 19), but may take over 100 years on less productive sites (Iverson *et al.* 1996, p. 71). These stands are typically harvested within a decade or two of reaching economic maturity, if they are in an area open



to logging. On lands managed for sustained-yield timber harvest, approximately 10 to 20 percent of the second growth is typically mature and suitable as goshawk habitat, although this percentage varies with harvest history, stand treatments, and current demand for timber (Daniel *et al.* 1979, pp. 304–344). Unharvested retention areas (e.g., stream buffers) provide old-growth habitat in addition to any mature second growth in harvested landscapes.

Goshawks hunt primarily by flying between perches and launching attacks from those perches. They take a variety of medium-sized birds and mammals, depending largely on local availability (Squires and Reynolds 1997, p. 1), which varies markedly among the islands in the Queen Charlotte goshawk's range. Red squirrels (*Tamiasciurus hudsonicus*) and sooty grouse (*Dendragapus fuliginosus*) (formerly blue grouse, *D. obscurus*) form the bulk of the diet in many locations, with thrushes, jays, crows, ptarmigan, and woodpeckers frequently taken as well (Ethier 1999, pp. 21–22 and 32–47; Lewis 2001, pp. 81–107; Lewis *et al.* 2004, pp. 378–382; Doyle 2005, pp. 30–31; Doyle 2006, pp. 138–139; Lewis *et al.* 2006, pp. 1154–1156). During winter, many avian prey species migrate from the region, reducing the variety and abundance of prey available (Ethier 1999, p. 22; MacDonald and Cook 1999, pp. 23–24; Nagorsen 2002, pp. 92–97; Doyle 2005, p. 31). Winter diets of the Queen Charlotte goshawk are largely unknown, although Titus *et al.* (2003, p. 49) used stable isotopes from feathers to characterize diets of individual birds, and suggested that squirrels, passerines, and for some goshawks, “intertidal marine birds” and ptarmigan may be important

prey outside the nesting season. Doyle (2004, p. 27; 2006, pp. 138–139) suggested that red squirrels and grouse are likely to be a key year-round prey, where they exist, since they remain active during the winter.

Prey availability is defined by prey abundance and suitability of habitat for successful hunting. Commercial logging can reduce both. Studies in coastal British Columbia have documented that density of important prey species including varied thrush (*Ixoreus naevius*), hairy woodpecker (*Picoides villosus*), and red-breasted sapsucker (*Sphyrapicus ruber*) are reduced by clearcut logging (Savard *et al.* 2000, pp. 59–63). Species consistently favored by clearcut logging tended to be small birds such as sparrows and warblers (Savard *et al.* 2000, pp. 32–33), which are not a major component of goshawk diets (Lewis *et al.* 2006, pp. 1153–1156). Red squirrel densities on the Queen Charlotte Islands were low in young second growth stands, but increased with age, peaking in 40 to 49-year-old stands (Doyle 2004, p. 23).

Old growth and mature second-growth forests provide productive habitat for prey species in a setting where goshawks can effectively hunt. Timber harvest is believed to result in prey population declines because few potential prey species within the range of the Queen Charlotte goshawk are adapted to open and edge habitats (Doyle 2006, pp. 138–139; Doyle and Mahon 2003, p. 1; reviewed by Iverson *et al.* 1996, pp. 59–61; USFWS 2007, pp. 42–45). Goshawk researchers have suggested that when and where logged areas grow into dense second-growth

stands, hunting is impaired because these stands do not offer adequate flight space (e.g., Iverson *et al.* 1996, p. 71; DeStefano and McCloskey 1997, p. 38; Beier and Drennan 1997, p. 570; reviewed by Greenwald *et al.* 2005, pp. 125–126; USFWS 2007, pp. 62–67), although goshawks in coastal forests of western Washington have been observed hunting over dense second-growth stands (Bloxtton 2002, pp. 42–43). Outside the range of the Queen Charlotte goshawk, where prey adapted to open habitats are more common, goshawks have been observed hunting forest edges and openings (e.g., Kenward 1982, pp. 69–79; Kenward 2006, pp. 155–165.).

Queen Charlotte goshawk nests are typically located in large trees within mature or old-growth forest stands that have greater volume and canopy cover than the surrounding forest (Iverson *et al.* 1996, pp. 47–56; Flatten *et al.* 2002, pp. 2–3; McClaren 2003a, p. 12; McClaren and Pendergast 2003, pp. 4–6; Doyle 2005, pp. 12–14; USFWS 2007, pp. 26–30). Nesting pairs appear to be territorial, with nests spaced somewhat uniformly across available habitat. Nesting density, as measured by mean distance between adjacent nesting areas, appears to vary with habitat quality (primarily prey availability). Mean distance between nesting areas ranged from 4.3 miles (mi) (6.9 kilometers (km)) on Vancouver Island (McClaren 2003a, p. 13) to 6.7 mi (10.8 km) on the Queen Charlotte Islands (NGRT 2008, p. 8), yielding average nesting territories (circular plots centered on the nest area) of approximately 10,000 acres (ac) (3,700 hectares (ha)) on Vancouver Island and 25,000 ac (10,000 ha) on the Queen Charlotte Islands.

Queen Charlotte goshawks appear to nest at lower densities than northern goshawks studied elsewhere (reviewed by McClaren 2003a, pp. 13 and 21; Doyle 2005, p. 15; and USFWS 2007, pp. 45–47).

Studies of northern goshawks across the western United States suggest that successful goshawk home ranges typically contain between 40 and 60 percent suitable foraging habitat (mature and old-growth forest) (e.g., Reynolds *et al.* 1992, p. 27; Patla 1997, pp. 71–74; Patla and Trost 1997, p. 34; Finn *et al.* 2002, pp. 431–433). These observations are consistent with findings for Queen Charlotte goshawks (Doyle 2005, p. 14; Iverson *et al.* 1996, p. 55; USFWS 1997, pp. 36–38). Goshawks in Southeast Alaska have been documented using landscapes with as little as 23 percent cover by old forest (Iverson *et al.* year, p. 55).

Individual nests are frequently not used in subsequent years as pairs often move to an alternate nest. Most alternate nests are clustered within a few hundred acres (200 to 500 ha) (McClaren 2003a, p. 13; Flatten *et al.* 2001, pp. 9–11), although females have been documented leaving the nesting area altogether, nesting in subsequent years with a new mate in a different territory up to 95 mi (152 km) away. Males have been documented moving up to 2 mi (3.2 km) between subsequent nests, but apparently remain in their nesting territory in subsequent years (Flatten *et al.* 2001, pp. 9–10).

Nest occupancy (percentage of nest areas with adult goshawks present) and nesting activity (percentage of nest areas with eggs laid) appear to vary with habitat suitability, prey availability, and weather, with greater occupancy or activity in areas with less fragmented forest habitat and in years with higher prey abundance and warmer, drier weather (Doyle and Smith 1994, p. 126; Patla 1997, pp. 34–35; Finn *et al.* 1998, p. 1; Ethier 1999, pp. 31 and 36; Finn *et al.* 2002, pp. 270–271; McClaren *et al.* 2002, p. 350; McClaren 2003a, pp. 11 and 16; Desimone and DeStefano 2005, pp. 317–318; Fairhurst and Bechard 2005, pp. 231–232; Patla 2005, pp. 328–330; Salafsky *et al.* 2005, pp. 242–244).

When prey availability and weather are suitable and nesting is initiated, nest success (percent of active nests that fledge at least one young) is typically high (87 percent rangewide, 1991 to 2004), as is productivity (1.6 to 2.0 fledglings per active nest) (USFWS 2007, p. 54). Fledglings typically spend about 6 weeks within several hundred yards (several hundred meters) of their nests learning flight and hunting skills before dispersing (McClaren *et al.* 2005, p. 257). Retention of mature forest structure near the nest is believed to be important for supporting this developmental stage (Reynolds *et al.* 1992, pp. 15–16; Kennedy *et al.* 1994, p. 80; Ethier 1999, p. 31; Finn *et al.* 2002, pp. 270–271; McClaren 2003a, pp. 11 and 16; Desimone and DeStefano 2005, pp. 317–318; McClaren *et al.* 2005, pp. 260–261; Patla 2005, pp. 328–330).

#### *Range*

In our previous status reviews and findings, we identified the range of the Queen Charlotte goshawk as the islands and mainland of Southeast Alaska and the Queen Charlotte Islands and Vancouver Island in British Columbia (60 FR 33784; 62 FR 46710; 72 FR 63123; USFWS 2007). In April 2008, the “Northern Goshawk (*Accipiter gentilis laingi*) Recovery Team” (NGRT) in Canada released a recovery strategy for the Queen Charlotte goshawk. The NGRT reviewed morphometric and radio-telemetry data, and distribution of coastal habitat and prey, and determined that, in addition to Vancouver Island and the Queen Charlotte Islands, the coastal mainland of British Columbia west of the Coast Range (including the Coastal Douglas-fir biogeographic zone and wet Coastal Western Hemlock subzones and variants) is also within the range of the subspecies (NGRT 2008, pp. 3–6). We believe that the NGRT’s determination is the best available information on the range of the bird in Canada. Therefore, for purposes of this listing, we define the range of the DPS to include that portion of British Columbia that includes Vancouver Island and its surrounding islands, the mainland coast west of the crest of the Coast Range and adjacent islands, and the Queen Charlotte Islands (see map at [http://alaska.fws.gov/fisheries/endangered/pdf/goshawk/Goshawk\\_2.pdf](http://alaska.fws.gov/fisheries/endangered/pdf/goshawk/Goshawk_2.pdf)).

## **Summary of Comments and Recommendations**

### *Peer Review*

In accordance with our peer review policy published on July 1, 1994 (59 FR 34270), we solicited expert opinion on our proposed rule from knowledgeable individuals with scientific expertise that included familiarity with the Queen Charlotte goshawk and its habitat, biological needs, and threats, and from forest managers familiar with forest conditions and management in British Columbia. We contacted five experts, and received responses from British Columbia Ministry of Environment (two reviewers), British Columbia Ministry of Forests and Range (two reviewers), and Alaska Department of Fish and Game (one reviewer). These were the only comments provided by State or Provincial government agencies, and are considered recommendations from the States.

We reviewed all comments we received from the peer reviewers for substantive issues and new information regarding the proposed listing of the subspecies. The reviewers made several suggestions to improve the accuracy and completeness of the rule, including new information that was not available when we completed our status review. Most reviewers stated that our conclusions appeared to be reasonable; one believed that our conclusions may be reasonable, with clarification of a few key, technical points. Peer review comments are addressed in the following summary and incorporated into the final rule as appropriate.

#### *Peer Reviewer Comments*

(1) Comment: Scientific uncertainty is not clearly expressed.

Our Response: We have carefully reviewed the proposed rule, and modified the language to be less assertive where uncertainty exists. For example, we have added qualifying language such as “may be,” “suggests,” “appears to be,” or “is likely to” where data or logic suggest an interpretation that is equivocal. Where appropriate, we have added discussions of alternative explanations or interpretations.

Our analyses of forest resources rely on data sets compiled from various sources. We made several assumptions and adjustments to produce estimates of habitat availability across land ownerships and jurisdictions, and to make projections of future conditions. These assumptions and adjustments are described in our status review (USFWS 2007) and updated appendices (USFWS 2010), and are not repeated in detail in this final rule. We have added text acknowledging that the various sources of data for forest cover vary in their reliability.

(2) Comment: Use of literature to support specific points is inconsistent, inappropriate, or incomplete.

Our Response: We have used a wide variety of literature to support this rule. In doing so, we have endeavored to use peer-reviewed, published literature



reporting on work from within the range of the Queen Charlotte goshawk whenever possible, as our first choice. Where such literature was not available, we have relied on unpublished reports and abstracts from scientific meetings that report on Queen Charlotte goshawks. We have also used many publicly available forest management documents, including plans, reports, agreements, and official agency news releases.

We have used peer-reviewed publications on goshawks from outside the range of the Queen Charlotte goshawk when deemed necessary to show consistency or diversity of findings across broad geographic areas, such as North America or western North America. In some cases, we have reported (or added) observations from coastal forests adjacent to the range of the Queen Charlotte goshawk, where we believe those observations offer useful insight. We have, in a few cases, used more general references, such as textbooks, when summarizing topics peripheral to the subject of goshawk biology and conservation. We have relied on draft documents only if they were available to the public, through agency web sites, for example. We have avoided draft manuscripts that were in preparation and not generally available to the public. In a few cases, we have cited preliminary research results released openly at interagency meetings, but have characterized these as preliminary and unconfirmed.

Reviewers have suggested several additional references, most of which were not available when we prepared our status review (USFWS 2007) or the

proposed rule. These have been incorporated into the final rule where appropriate.

(3) Comment: The Service's *Queen Charlotte Goshawk Status Review* (USFWS 2007) is primarily a literature review which does not present original field data so should not be cited as a reference; nor should other literature reviews.

Our Response: The final rule includes a summary of goshawk biology and habitat relations, but it is not intended to be an exhaustive treatise on the topic. More detail on many of the topics discussed in the final rule is available in our status review (USFWS 2007). Where that document contains a review of relevant literature, we refer the reader to it, with the phrase "reviewed by USFWS 2007, pp...." We use the phrase "reviewed by..." to identify other literature reviews used in preparation of this rule, as well.

The status review and its companion (updated) appendices (USFWS 2010) also contain compilations and original analyses of unique data sets on forest resources across the range of the goshawk, drawn from a variety of sources. These data and the assumptions associated with them have been reviewed by the U.S. Forest Service and the British Columbia Ministry of Forests and Range. These analyses are central to our findings, and are cited throughout the final rule.

(4) Comment: Science, conservation, judgment, speculation, opinion,

policy, law, and rulemaking are not clearly separated in the proposed rule.

Our Response: The final rule is a blend of scientific reporting, synthesis and interpretation, application of policy, and legal findings. This is inescapable. We have endeavored to clearly delineate among these categories in the final rule. Scientific results are typically identified by words such as “documented,” “reported,” or “found,” followed by, or preceded by, a citation. Where we relate interpretations by those scientists, as are often found in the discussion sections of scientific papers and reports, we typically use phrases such as “interpreted,” “believed,” or “concluded.” Our interpretations and conclusions are identified similarly, for example, “we interpret this as...,” “we consider this...,” or “we conclude...” Where we discuss specific policies, we generally describe the policy, often with a list of relevant considerations, and then discuss the application of the policy, in this case. Conclusions related to our legal authorities are typically stated as findings, for example, “we find that...” or “we conclude that...”

(5) Comment: The link between loss of mature/old forest and goshawk population declines should be more clearly described.

Our Response: We have modified the text in several places to explain the basis of our conclusion that reduction of forest cover has reduced the ability of the landscape to support breeding goshawks, primarily through alteration of hunting

habitat. No study has documented population declines as a direct result of logging, likely due, in part, to the difficulty in directly censusing goshawk populations. There is evidence from outside the range of the Queen Charlotte goshawk that logging reduces nest activity, which is believed to have reduced nesting populations (e.g., Crocker-Bedford 1990, pp. 263–267). Several investigators from across the range of the northern goshawk have concluded that prey availability, as controlled largely by forest structure, is more likely than nest site availability to limit goshawk populations (Doyle and Smith 1994, p. 126; Widen 1997, pp. 110–112; Reynolds and Joy 1998, p. 2; Reynolds *et al.* 2006, pp. 264–268 and 271–273). Within the range of the Queen Charlotte goshawk, models that estimate habitat capability and management recommendations to conserve goshawk habitat are based largely on observation and measurement of areas where goshawks successfully nest, and where they do not. These observations are supported by additional observations on distribution and availability of prey. Together, this body of knowledge represents the best available information on landscape management for conservation of goshawks. Our charge under the Act is to use the best available data to support our listing decisions.

(6) Comment: References should be cited to support the statement that commercial logging reduces prey.

Our Response: Text has been added that describes studies from British

Columbia that address changes in bird communities with clearcut logging, and use of second-growth forest stands by red squirrels.

(7) Comment: Prey populations may be more stable within the range of the Queen Charlotte goshawk than elsewhere, so discussions of fluctuations in nest activity due to fluctuations in prey do not apply to the subspecies.

Our Response: We are aware of no data that show prey populations in the range of the Queen Charlotte goshawk are more stable than elsewhere, and the reviewer provided no information to support the statement. In contrast, prey fluctuations in coastal British Columbia are specifically discussed by Doyle (2003), and Doyle (2007, p. 2), particularly as related to squirrel population response to fluctuations in cone crops.

(8) Comment: Snowshoe hares (*Lepus americanus*) and hoary marmots (*Marmota caligata*) are unlikely to be significant prey species because hares are not common along the mainland coast and adult marmots are too large for goshawks.

Our Response: We have deleted the discussions of both snowshoe hares and hoary marmots as potentially significant prey resources for goshawks along the mainland coast. We previously believed that snowshoe hares might provide prey for goshawks in recently logged areas along the mainland coast because

Nagorsen (2002, p. 93) described the range of the species as “the entire mainland of British Columbia but absent from coastal islands.” The reviewer points out a more recent work by Nagorsen (2005, pp. 85–91) which indicates that snowshoe hares are not common along the coastal mainland. We simply misjudged the size differential of adult hoary marmots as potential prey.

(9) Comment: The proposed rule suggests that goshawks do not use young second growth for hunting, but Bloxton (2002, pp. 42–43) presented telemetry data suggesting that goshawks will hunt in some second-growth stands, to some degree.

Our Response: We have modified the text to acknowledge Bloxton’s observations from western Washington.

(10) Comment: Unpublished literature on the morphology of Queen Charlotte goshawks has been made available to the Service, but has not been referenced or used. This information could be used to support an alternative approach to understanding subspecies concepts, or as evidence of hybridization, and to help evaluate distinctiveness of goshawks on the Queen Charlotte Islands.

Our Response: We addressed size and color (i.e., morphology) of Queen Charlotte goshawks in relation to other purported subspecies, and in relation to range boundaries, in our status assessment (USFWS 2007, pp. 13–19) and in our

Response to Court (72 FR 63125). Among the recent, unpublished reports and conference abstracts that we have evaluated and cited in these reviews are Titus *et al.* (1994), Flatten *et al.* (1998, 2001b, 2002), and Flatten and McClaren (2003). We are in possession of one additional, draft manuscript by two of these same authors that to our knowledge has not been submitted for publication, and has not been otherwise released for general distribution. Its findings are generally consistent with the work reported in the other references named above. For these reasons, we have not cited it.

These reports describe size and color variation among goshawks on Vancouver Island and in Southeast Alaska, but not the Queen Charlotte Islands or mainland British Columbia. The findings are largely consistent with published subspecies descriptions, but with much larger sample sizes. The authors suggest that the observed variation in size and color may represent a clinal variation, with smaller birds to the south and larger birds to the north. We have added text to the final rule describing this work, as an alternative approach to understanding subspecies concepts, and as possible evidence of hybridization along the margins of the subspecies' range. We have not used these references in our evaluation of the Queen Charlotte Islands as a significant portion of the range because birds from these islands were not included in the analyses.

(11) Comment: Several terms in the proposed rule are undefined. A glossary would be useful.

Our Response: We have provided definitions of all technical terms upon their first use, in the text. Some discussions have been reworded to minimize technical terms and eliminate jargon.

(12) Comment: Discussions of forestry and forest management should be removed from the section on goshawk biology and moved into a (new) section on conservation/management.

Our Response: We have chosen to leave our discussions of forest succession and forest management in the section on goshawk biology and habitat because it is relatively brief and is directly relevant to understanding goshawk habitat limitations in areas where forests are managed for timber production.

(13) Comment: The Service should consider noting that active research and monitoring of goshawk nests has not occurred in Southeast Alaska since about 2000, so status of the bird is less certain than it was 6 to 9 years ago.

Our Response: This rule implements our 2007 finding that listing is warranted for the British Columbia DPS, but not Southeast Alaska (72 FR 63123). We, therefore, focus on threats in British Columbia, and do not address Southeast Alaska, except to describe previous agency actions. We have not added the suggested note because it does not provide information useful to our decision for



British Columbia.

(14) Comment: The final rule should include discussions of clinal variation and breeding dispersal in the discussion of hybridization as a threat.

Our Response: We have added discussions on both of these topics.

(15) Comment: The discussion of Foreseeable Future fails to address uncertainty and does not adequately link habitat change to goshawk viability.

Our Response: We have revised the discussion of foreseeable future to better describe the data sources we used to estimate the amount of suitable goshawk habitat we believe will be available in the future, and the uncertainty associated with those estimates. We have repeated our understanding of the relationship between timber harvest, forest regeneration, and goshawk habitat, to clarify the basis for our inferences about the quantity and quality of goshawk habitat likely to exist in the future, given the timber harvest regimes currently envisioned.

(16) Comment: The basis for determining that Queen Charlotte goshawks in British Columbia are a DPS is not clear in the proposed rule. Is it based on a geopolitical boundary or is it based on biology and population ecology?

Our Response: We have added text that clarifies the two-part test defined by our DPS policy—first, that the populations are distinct, and second that they are significant. In this case we establish (1) that the population segments are distinct because they are separated by an international border across which habitat management and other regulatory mechanisms differ. Then we establish (2) that the population segment in British Columbia is significant to the taxon because it occupies approximately two thirds of the land area and three quarters of the productive forest habitat in the range of the subspecies, and may contain important genetic diversity for the subspecies.

(17) Comment: The description of how “significant portion of the range” is defined is rather general and not particularly useful.

Our Response: The Act defines an endangered species as “any species which is in danger of extinction throughout all or a significant portion of its range” and a threatened species as “any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range” (16 U.S.C. 1532). The term “significant portion of the range” is not defined in the Act or its implementing regulations.

In the proposed rule, we defined a significant portion of a species’ range as an area important to conservation of the species because it contributed meaningfully to representation, resiliency, or redundancy of the species.

Representation, resiliency, and redundancy were discussed as general concepts; specific circumstances of each potentially significant portion of the British Columbia DPS's range were examined to evaluate how each area contributed to conservation of the DPS. In the final rule, we retain our focus on a given area's contribution to conservation of the DPS through redundancy, resiliency, and representation, but set a threshold for "significant" in terms of extinction risk. As described in the rule, a portion of the range is significant if the DPS would be in danger of extinction without the portion in question. This approach recognizes the Queen Charlotte goshawk itself as the reference point for determining whether a portion of the range is "significant," and is consistent with recent case law on the matter (*see Greater Yellowstone Coalition v. Servheen*, 672 F. Supp. 2d. 1105,1124 (D. Mont. 2009)).

Since publication of the proposed rule, two district court decisions have influenced our interpretation of how to proceed if a portion of the range is deemed significant, and the goshawk is found to be either endangered or threatened within that portion of the range. In *Defenders of Wildlife v. Salazar* (729 F. Supp. 2d 1207 (D. Mont. 2010)) and in *WildEarth Guardians v. Salazar* (2010 U.S. Dist LEXIS 105253 (D. Ariz. Sept 30, 2010)), the courts ruled that the term "significant portion of the range" helps to define the circumstances under which a species should be listed as endangered or threatened. The courts ruled that the term does not, however, provide a basis for listing a species in only a portion of its range. Rather, if the Service determines that a species is endangered or

threatened in a significant portion of its range, the species must be listed throughout its range. Because the Act defines “species” to include “any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature,” the same logic applies to both subspecies and distinct population segments (e.g., a subspecies or DPS found to be endangered in a significant portion of its range must be listed as endangered throughout its range). This interpretation is consistent with the somewhat ambiguous language of the Act, appears to implement Congressional intent, and is consistent with previous listing actions by the Service. We, therefore, adopt this interpretation in the final rule.

(18) Comment: Goshawks have been extirpated from urbanized areas such as Victoria on Vancouver Island, and that range is now occupied by Cooper’s hawks. Scientific rationale should be provided to explain why such areas are considered part of the range of the listed subspecies.

Our Response: Goshawks are highly mobile and have established nests near human habitation in some situations. We believe that they could move through, and possibly nest near, any urbanized area within the range of the DPS, on Vancouver Island or elsewhere. In such cases, the birds themselves would remain listed entities. The Service does not designate critical habitat in foreign countries (50 CFR 424.12(h)), so inclusion of any area within our defined range of the DPS would create no additional restrictions or regulatory burdens under the

Act.

(19) Comment: Discussions of potential impacts from disease should be supported by references.

Our Response: We have expanded our discussion of disease risks, with citation of relevant literature.

(20) Comment: The discussion of inbreeding depression as a risk to small populations such as the one on the Queen Charlotte Islands should consider how this topic has been dealt with for other small raptor populations.

Our response: The rule now mentions managed captive breeding and translocation as potential methods for mitigating the effects of low genetic diversity, as these methods have been used for other small populations, including raptors such as peregrine falcons and Mauritius kestrels.

(21) Comment: Several reviewers commented that the quality of second growth stands as potential habitat for goshawks in the future is under-represented.

Our Response: As we discuss in the rule under “Queen Charlotte Goshawk Biology and Habitat,” second-growth stands develop structure suitable to support nesting and foraging as the stands approach “economic maturity,” which is the

age at which average annual growth of individual trees in a second-growth stand begins to slow. This may occur as early as 45 to 50 years on the most productive sites, but may take more than 100 years on less productive sites. We use the term “mature” or “mature second growth” to identify stands with suitable nesting and foraging structure that have regenerated following timber harvest or other forest disturbance. Throughout the rule, we use the phrase “mature and old-growth habitat” or “mature and old forest” to describe suitable goshawk nesting and foraging habitat, explicitly acknowledging the value of second-growth forests as goshawk habitat. Our analyses of forest cover assume that where second-growth stands will continue to be managed for timber production, approximately 15 percent of the second-growth forest will be of a structural stage that would support goshawk nesting at any given time, although this is likely to vary with harvest history, site productivity, and silvicultural treatments. Where second-growth stands will be protected from logging in the future, our analyses assume that previously harvested stands will provide suitable nesting and foraging habitat.

(22) Comment: The final rule should include updated information on the status of Land Use Planning processes for coastal mainland British Columbia and Haida Gwaii.

Our Response: As we acknowledge in this final rule, Land Use Planning continues to evolve in coastal British Columbia. We have used the most current information on the status of Land Use Planning processes available to us.

(23) Comment: There is too much emphasis placed on the South Island Forest District, which is only a portion of the goshawk's range in British Columbia.

Our Response: We necessarily focus on Vancouver Island as a potential “significant portion of the range” of the Queen Charlotte goshawk because we have been directed to do so by the District Court of the District of Columbia (*Southwest Center for Biological Diversity v. Norton*, No. 98-0934 (D.D.C. May 24, 2004)). The South Island Forest District covers the southern half of Vancouver Island plus several adjacent islands. The District includes some of the highest productivity forests in the range of the Queen Charlotte goshawk, and has some of the greatest challenges to conservation from timber harvesting, other competing land uses, and other species of conservation concern. The northern half of Vancouver Island and portions of the mainland are included in two other forest districts. These districts both have substantially lower levels of human impact, but are also managed for timber production. Our explicit consideration of the South Island Forest District (now called South Island Resource District) is limited to a brief discussion of the overlap between high levels of endemism and human impacts there.

(24) Comment: Results of spatially explicit modeling of goshawk habitat in coastal British Columbia are now available to estimate the number of goshawk

territories that might have been supported historically, currently, and in the future (Smith and Sutherland 2008).

Our Response: Although the cited reference is dated 2008, it was used internally by the NGRT and not available for public use when we wrote the proposed rule in 2009. Now that the document has been released, we have incorporated this important work into the final rule.

(25) Comment: Definitions and criteria used to evaluate habitat quality based on the percentage of mature/old forest are confusing and habitat quality classes appear to overlap.

Our response: One of the statistics we use to evaluate habitat quality is percentage of the landscape covered by mature and old forest, based on evaluations of goshawk habitat by Doyle and others in coastal British Columbia. In the proposed rule, we defined landscapes on Vancouver Island and the Queen Charlotte Islands differently than landscapes on the mainland, based on perceived differences in prey communities (see comment concerning snowshoe hares and marmots, above). Because we no longer believe that prey communities on the mainland are significantly more diverse than on the islands, we have eliminated this difference, and now consider landscapes with less than 40 percent cover by mature and old forest low-quality habitat and landscapes with greater than 40 percent cover by mature and old forest high-quality habitat, across the range of



the DPS. A discussion of supporting literature is included in the rule.

(26) Comment: Since your analyses were completed in 2007, there have been reallocations of lands from 6 of the 11 Tree Farm Licenses on Vancouver Island to create a new Timber Sale Area, and private lands have been removed from three of the Tree Farm Licenses. Timber Supply Analyses have been updated for two of the three Timber Sale Areas on Vancouver Island.

Our Response: Timber supply analyses and logging projections by the Ministry of Forests and Range and timber tenure holders in British Columbia, which formed the basis of our 2007 analyses, are dynamic. We have not attempted to reanalyze these data because we do not believe that the reallocations will substantially alter the results or our conclusions. We base this on the fact that the lands removed from the Tree Farm Licenses appear to remain primarily in timber production status. They are, therefore, unlikely to provide significant additional protection for goshawk habitat.

(27) Comment: Approximately 27 percent of Vancouver Island is in private ownership. Forest cover data are not available for these lands, so habitat availability is underestimated in the proposed rule. These lands are believed to be very productive for goshawks. The Government of British Columbia has little influence on management of private lands to conserve goshawk habitat.

Our Response: We used estimates of forest cover on private lands provided by Neimann (2006). These data are designated “BTM/BEC” (Baseline Thematic Mapping/Biogeoclimatic Ecosystem Classification) in Neimann’s (2006) tables, and total 939,000 ha, or 27 percent of Vancouver Island (matching the reviewer’s estimate), including approximately 791,000 ha of forest. Of this total, 77 percent (609,000 ha) is second growth. We have acknowledged the Government of British Columbia’s limited ability to manage timber harvest and goshawk habitat conservation on private lands in this final rule.

(28) Comment: Data on forest cover used in the rule come from a variety of sources of varying dates and of variable reliability. The limitations of these data are not well expressed, potentially leading readers to believe the data are more complete and accurate than they really are, especially for private land.

Our Response: Sources of data on forest and other land covers, and assumptions we made in developing various statistics, are listed primarily as footnotes in the tables of our updated appendices (USFWS 2010). The base data were gleaned from many sources. We endeavored to ensure the data were as comparable as possible, but as the reviewer notes, current, consistent data across ownerships do not exist. We acknowledge that there are several potential sources of error in these data, including differences in how forest covers were defined and categorized, harvest and growth that has occurred since the data were developed, and misclassifications of land cover. We have not provided definitive descriptions

of the statistical error associated with these error sources primarily because no such estimates are available, to our knowledge. We continue to believe that our rangewide and regional estimates of forest cover and composition are the best available.

(29) Comment: Some of the statistics on forest cover in the appendix tables cited (USFWS 2008) do not sum across columns correctly.

Our Response: We have reviewed the data summaries in question and have corrected arithmetic errors. The updated information used in the final rule is presented in USFWS (2010). We have not updated tables A-10 through A-15, which present “Habitat Value” modeling discussed in our status review (USFWS 2007, pp. 99–101) because we do not use these analyses in the final rule.

(30) Comment: “Productive forest” is defined differently in Alaska than it is in British Columbia, potentially biasing comparisons between the two jurisdictions.

Our Response: This rule focuses on conditions within British Columbia, rather than comparing conditions in British Columbia to those in Southeast Alaska, so the issue is largely moot for purposes of this rulemaking. For our status review (USFWS 2007, 2010) and rangewide finding in our Response to Court (72 FR 63123), we developed estimates of productive forest across coastal British

Columbia and Southeast Alaska. We relied on definitions used by the U.S. Forest Service and the British Columbia Ministry of Forests and Range, which do indeed differ. The definition used by the Ministry was qualitative (“capable of producing a merchantable stand within a defined period of time”), while the Forest Service’s was quantitative (“capable of producing at least 20 cubic feet of wood fiber per acre per year, or having greater than 8,000 board feet per acre”). Goshawks rely on mature forest structure, rather than forest volume, so the difference is probably not critical for purposes of characterizing goshawk habitat, as long as the low-end productive forest by British Columbian standards is structurally similar to low-end productive forest by Alaskan standards. We assumed that they are because both agencies use these definitions to differentiate forests that produce enough wood volume to support commercial timber harvest from those that do not.

(31) Comment: Statistics in Table A-9 of the Service’s updated appendices (USFWS 2008) do not account for old-growth forest that will not be harvested to protect non-timber values such as “Identified Wildlife” habitat, riparian retention, unstable ground, etc.

Our Response: Estimates of the amount and percentage of forest that will not be harvested within areas otherwise open to timber harvest, to protect non-timber values, are displayed in Table A-9 in the column labeled “Retention.” Forest that will not be harvested because it is too steep, wet, unstable, etc., is displayed in the column labeled “Inoperable.” These estimates come from Timber

Supply Analysis Reports provided by the British Columbia Ministry of Forests and Range.

(32) Comment: The proposed rule assumes that all old growth will be logged before second-growth logging begins, but 35 percent of the current harvest comes from second growth. This percentage is expected to rise over the next 50 years.

Our Response: We discussed the mix of old growth and second growth in the current harvest, and as an increasing percentage of the harvest, in our status review (USFWS 2007, pp. 90–91). We reviewed Timber Supply Analysis Reports for each timber tenure in the Coast Forest Region to determine the rate at which second growth would replace old growth in the harvest. We did not assume that all old growth would be logged before second growth logging begins, and none of our analyses or conclusions depends on such an assumption.

(33) Comment: There is inadequate discussion of emerging tools, techniques, and policies to minimize impacts to goshawks from timber harvest in British Columbia.

Our Response: The broad and expanding suite of forest management tools and restrictions used by the province of British Columbia is discussed under

“Factor D—Inadequacy of Regulatory Mechanisms” and under “Evaluation of Conservation Efforts.”

### *Public Comments*

In the proposed rule published on November 3, 2009, we requested that all interested parties submit written comments on the proposal by December 8, 2009. We also contacted appropriate Federal and State agencies, scientific experts and organizations, and other interested parties and invited them to comment on the proposal. We did not receive any requests for a public hearing.

During the comment period, we received comments from five parties, including a falconer’s group, an environmental education center, the Canadian Wildlife Service, and two individuals. Two commenters supported our proposal to list the subspecies, one opposed the proposal, and two expressed no preference. All substantive information provided during the comment periods is addressed below, and has been incorporated into this final determination as appropriate.

(34) Comment: Listing the British Columbia DPS as threatened or endangered is inappropriate because (a) there is no evidence of significant range contraction or population declines, (b) only 3 to 5 percent of the forest habitat has been permanently lost to urbanization and agriculture, and (c) approximately half of the estimated population and nearly two thirds of the geographic area occupied

by the DPS are on the mainland coast, where threats due to logging are believed to be “low to moderate.” Instead, more careful and comprehensive forest management planning is appropriate, especially in the Vancouver Island Conservation Region.

Our Response: The Act lists five threats or “factors” that we are to base our listing decisions upon. These include (A) the present or threatened destruction, modification, or curtailment of habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting the species continued existence. For a species to be listed under of the Act, documentation of either range contraction or population decline is not required. Instead, the Act is intended to address threats that either have caused, or are expected to cause, such effects.

Our review considers threats to habitat broader than conversion of forest to urban or agricultural uses. As we explain in this rule, clearcut logging is believed to be a threat because it creates openings with few suitable prey, and results in dense stands of second-growth forest that goshawks tend to avoid until those stands approach maturity. Habitat modeling recently released by the NGRT suggests that across British Columbia, habitat capability (the number of goshawk territories that could be supported) has declined by approximately 33 percent since industrial logging began approximately 100 years ago. Threats from logging

appear to be somewhat lower on the mainland coast than they are on either the Queen Charlotte Islands or Vancouver Island. Still, our analyses indicate that habitat loss on the mainland coast is likely to contribute to declines and increased vulnerability of the small mainland population, which the NGRT estimates to be approximately 177 to 191 breeding pairs, based on habitat capability modeling and observed territory occupancy rates (NGRT 2008, p. 8).

(35) Comment: The Queen Charlotte Islands should not be considered a significant portion of the DPS's range because these islands provide only 9 percent of the area and support only about 3 to 5 percent of the breeding population. Further, the islands are only about 5 percent of the subspecies' entire range, and support only about 2 percent of the entire population. Therefore, listing goshawks on the Queen Charlotte Islands differently from how the subspecies is classified elsewhere within the DPS is not warranted.

Our Response: This rule addresses whether the Queen Charlotte Islands (and other such portions of British Columbia) constitute a significant portion of the range of the British Columbia DPS. It does not address whether the Queen Charlotte Islands (or any other areas) are a significant portion of the subspecies' entire range, which includes Southeast Alaska. The statistics provided by the commenter about percentages of the subspecies' entire range are, therefore, not relevant to this inquiry.



Our evaluation of significance, as related to “significant portion of the range,” is based on contribution of the area toward conservation of the DPS through representation, resiliency, and redundancy. The standard used in this rule differs from the standard we proposed in 2009 (74 FR 56757), as described below. We believe that this approach appropriately focuses on the biology and conservation status of the bird, best conforms to the purposes of the Act, and is consistent with judicial interpretations of the phrase “significant portion of the range.”

(36) Comment: Because nesting habitat and prey numbers may limit goshawk populations in fragmented landscapes, goshawk habitat should be managed at varying scales to ensure adequate nesting and foraging habitat at the population level, as done through the Tongass Conservation Strategy in Southeast Alaska. Proper habitat management, not listing under the Act, is the key to species conservation.

Our Response: We agree with the commenter that appropriate habitat management at various scales is necessary to conserve goshawks where forests are managed for timber production and other values. However, when our analyses indicate that a species is in danger of extinction or is likely to become so in the foreseeable future, we are obligated to add it to the list of endangered or threatened species, as appropriate. With foreign species as considered in this rule, we have no authority to implement management and recovery efforts after listing.

In this case we have, however, been working with the Provincial government and contributing to these efforts through membership on the NGRT and through exchange of information and draft document reviews, and intend to continue doing so.

(37) Comment: Consider supplementing the limited genetic diversity on the Queen Charlotte Islands by translocating birds from nearby island populations.

Our Response: This management recommendation is beyond the scope of this rule, and our authority. The NGRT has considered the issue of genetic isolation, and potential strategies to address it. We will ensure that the recovery team in British Columbia is aware of this recommendation.

(38) Comment: The Service should exercise due caution and all appropriate scientific skepticism in evaluating claims regarding the Queen Charlotte goshawk to avoid using the Act as a tool to curtail logging if the subspecies is not facing the threat of possible extinction.

Our Response: We have conducted a thorough assessment of the status of the Queen Charlotte goshawk (USFWS 2007). We have evaluated the best available data and other information and carefully considered the issues confronting the subspecies. Our analyses and findings have been published and

independently reviewed. We have concluded that while recent and ongoing changes in forest management in British Columbia are encouraging, they have yet to fully demonstrate that they will be effective at protecting goshawk populations from ongoing threats related primarily to habitat loss from timber harvesting. We are, therefore, obligated under the Act to list the subspecies. We note, however, that neither the Service nor any other agent of the United States Government has authority to modify forest management in British Columbia. Our intent is to continue to assist when requested, and to encourage collaboration to affect rangewide conservation of the subspecies.

(39) Comment: If goshawks are listed in British Columbia, legal take of goshawks should not be affected outside the area in which they are listed, under “similarity of species” authorities.

Our Response: Section 4(e) of the Act authorizes the Service Director to designate non-listed species that closely resemble listed species as Threatened or Endangered for purposes of take, possession, transport, trade, export or import. In determining whether a species should be designated under this similarity of appearance authority, we must consider (1) the degree of difficulty enforcement personnel would have in distinguishing the species from a listed species, (2) the additional threat posed to the listed species by the loss of control occasioned because of the similarity of appearance, and (3) the probability that so designated a similar species will substantially facilitate enforcement and further the purposes

and policy of the Act (50 CFR 17.50).

Although Queen Charlotte goshawks in British Columbia are essentially indistinguishable from those in Southeast Alaska, and difficult to tell from goshawks outside the range of Queen Charlotte goshawks, we do not believe that goshawks outside coastal British Columbia need to be designated under section 4(e) of the Act as threatened or endangered because we do not consider direct take for falconry or any other purpose to be a threat. Direct take is discussed further below under the heading “Factor B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes.”

### **Summary of Changes from Proposed Rule**

In the proposed rule, we determined that Vancouver Island (and surrounding smaller islands), the Queen Charlotte Islands, and the coastal mainland of British Columbia were each significant portions of the Queen Charlotte goshawk’s range, and that the subspecies should be listed as endangered on the Queen Charlotte Islands and threatened elsewhere in British Columbia. For this final rule, we have modified our method for defining “significant portion of the range” to be more consistent with recent court rulings, as described below under “Significant Portions of the British Columbia DPS’s Range.” As a result of this modified definition, Vancouver Island and the mainland coast of British Columbia are considered significant portions of the range, but the Queen

Charlotte Islands are not. Because it is no longer considered a significant portion of the range, we no longer consider listing the population on the Queen Charlotte Islands as endangered to be warranted.

In both the proposed and final rules, we have used percentages of the landscape covered by mature second-growth and old-growth forest to define quality of the habitat. In the proposed rule, we used different standards for the mainland than we did for the islands, based on what we believed were differences in prey species availability, with snowshoe hares and marmots available to goshawks on the mainland but not on the islands. Information provided through our peer review indicates that snowshoe hares are not common along the coast, and adult marmots are too large for goshawks to regularly prey upon. We have, therefore, modified our indicators of high- and low-quality landscapes to be consistent across the DPS.

### **Review of the British Columbia DPS**

Section 3(15) of the Act defines “species” to include “any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature.” To interpret and implement the DPS provisions of the Act and Congressional guidance, the Service and the National Marine Fisheries Service published a “Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act” (DPS policy) in the **Federal**

**Register** on February 7, 1996 (61 FR 4722). Under the DPS policy, three factors are considered in a decision concerning the establishment and classification of a possible DPS. The first two factors, (1) discreteness of the population segment in relation to the remainder of the taxon and (2) the significance of the population segment to the taxon to which it belongs, bear on whether the population segment is a valid DPS.

Under the DPS policy, a population may be considered discrete if (1) it is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors; or (2) it is delimited by international governmental boundaries with differences in control of exploitation, management of habitat, conservation status, or relevant regulatory mechanisms. Significance in the context of the DPS policy is considered in relation to the population segment's importance to the taxon to which it belongs. This consideration may include, but is not limited to: (1) its persistence in an ecological setting unusual or unique for the taxon; (2) evidence that its loss would result in a significant gap in the range of the taxon; (3) evidence that it is the only surviving natural occurrence of a taxon that may be more abundant elsewhere as an introduced population outside its historic range; or (4) evidence that the discrete population segment differs markedly from other populations of the species in its genetic characteristics.

If a population meets both tests, we consider it a DPS and then the third

factor—the population segment’s conservation status in relation to the Act’s standards for listing, delisting, or reclassification, (i.e., should the population segment be listed as endangered or threatened)—is applied.

In our Response to Court in 2007 (72 FR 63128–63129), we determined that Queen Charlotte goshawks in British Columbia were distinct from those in Southeast Alaska, with differences in conservation status, habitat management, and regulatory mechanisms. We also found that the population segments in British Columbia and Southeast Alaska were both significant as defined by our DPS policy, and concluded that two valid DPSs exist. Because forest management in both jurisdictions continues to evolve, we briefly review validity of the separate British Columbia DPS below.

We have estimated the effects of new protected areas on the Queen Charlotte Islands, and inclusion of the mainland coast of British Columbia, on future landscape condition in British Columbia and updated our analyses of forest resources across the range of the subspecies (USFWS 2010). We have considered modifications made to the 1997 Tongass Land Management Plan, as reflected in the 2008 forest plan. Significant differences in management regimes between Alaska and British Columbia remain. For example, we estimate that approximately 31 percent of the remaining old growth will ultimately be harvested and thereby converted to second growth in British Columbia, while only 12 percent of the remaining old growth will be harvested and converted to

second growth in Southeast Alaska (USFWS 2010, Table A-17). When considered together with areas already harvested, we estimate that 59 percent of the original productive old growth will ultimately be harvested in British Columbia, but only 28 percent will be harvested in Southeast Alaska (USFWS 2010, Table A-9). Other differences between the jurisdictions noted in our Response to Court (72 FR 63129), including conservation status of the subspecies and regulatory mechanisms, remain. We conclude that management of forest habitat remains sufficiently different between Alaska and British Columbia to support our previous conclusion that the international border separates two discrete populations with significant differences in habitat management and regulatory mechanisms.

In our Response to Court, we concluded that the British Columbia population was biologically and ecologically significant within the meaning of the DPS policy because it occupied approximately one third of the land area and half of the productive forest in the range of the subspecies. Preliminary, unconfirmed results also suggested that the province may contain a significant amount of the genetic diversity of the subspecies (Talbot 2006, p. 1). With inclusion of mainland British Columbia (which was not considered part of the range in our Response to Court), the province now provides approximately two thirds of the land area and about three quarters of the productive forest for the species, rangewide (USFWS 2010, Table A-9). We conclude that the British Columbia population segment is discrete and significant, and that it remains a distinct population segment under



the DPS policy.

### **Factors Affecting the British Columbia DPS**

Section 4 of the Act (16 U.S.C. 1533), and implementing regulations at 50 CFR 424, set forth the procedures for adding species to the Federal Lists of Endangered and Threatened Wildlife and Plants. Under section 4(a)(1) of the Act, we may list a species on the basis of any of five factors, as follows: (A) the present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. Information regarding the status of, and threats to, the British Columbia DPS of the Queen Charlotte goshawk in relation to the five factors provided in section 4(a)(1) of the Act is discussed below.

This final rule addresses the finding in our Response to Court (72 FR 63128) that listing as threatened or endangered is warranted for the British Columbia DPS. Below, we provide a summary of our analysis of threats to the British Columbia DPS from the Response to Court, along with a new analysis of threats to the DPS in light of relevant new information. We have included statistics on habitat availability and forest management where they are available. Our primary sources of forest data include the British Columbia Ministry of

Forests and Range (especially Niemann 2006 for Vancouver Island and the coastal mainland) and Leversee (2006) for the Queen Charlotte Islands. These data sets have been compiled from a variety of sources, which vary in their reliability. Our analyses of forest statistics is detailed in an updated appendix to our status review (USFWS 2010), in which our data sources, assumptions, and calculations are described. We also rely on the NGRT evaluation of the threats discussed below (NGRT 2008, pp. 16–21), and results of habitat modeling done to assist the NGRT in recovery planning (Smith and Sutherland 2008 pp. 1–88).

*Factor A. Present or Threatened Destruction, Modification, or Curtailment of the Habitat or Range*

Mature second-growth and old-growth forest provides nesting and foraging habitat for goshawks and supports populations of preferred prey (Iverson *et al.* 1996, pp. 16–18 and 41–44; Ethier 1999, pp. 61–68; McClaren 2004, pp. 6–7). Logging within and near nest stands has been implicated in nest site abandonment, although effects of such logging have varied from nest area abandonment in some study areas to no effect on productivity elsewhere (Crocker-Bedford 1990, pp. 263–266; Penteriani and Faivre 2001, p. 213; Doyle and Mahon 2003, p. 39; Mahon and Doyle 2005, pp. 338–340, Doyle 2006, pp. 138–139). Clearcut logging generally reduces prey populations (reviewed by USFWS 2007, pp. 62–64), although, in some cases, sooty grouse populations may increase temporarily following logging (Zwickel and Bendell 1985, pp. 185–187).

Logging may also impact foraging habitat by removing perches and hunting cover, and by creating openings and dense second-growth stands that are avoided by goshawks (Iverson *et al.* 1996, p. 36).

“Productive forest” is defined by the British Columbia Ministry of Forest and Range as forest capable of producing trees large enough to be commercially viable as timber (i.e., “merchantable”) (Niemann 2006, p. 1). Such forests, when mature, provide suitable structure for goshawk nesting and foraging. We, therefore, use the British Columbia Ministry of Forest and Range’s definition of, and statistics on, productive forest as a measurable approximation of goshawk habitat. Unless otherwise specified, discussions of mature, old-growth, and second-growth forests below refer to productive forest only. Areas of nonproductive (or “scrub”) forest of smaller trees (which are not included in the cited forest statistics) may be used by goshawks for foraging or other activities, but are generally not used for nesting (Iverson *et al.* 1996, pp. 41–44).

Goshawks nest and forage in a wide variety of settings, with varying amounts of forest cover, across North America, Europe and Asia (reviewed by Kenward 2006, pp. 293–294, Squires and Kennedy 2006, pp. 21–31). In the rainforest habitats of the Queen Charlotte goshawk, there are few prey species adapted to open habitats (Doyle and Mahon 2003, pp. 39; reviewed by Iverson *et al.* 1996, pp. 59–61 and USFWS 2007, pp. 42–45). For example, snowshoe hares and cottontail rabbits (*Sylvilagus* spp.) use forest edges and open habitats and are

important prey in some areas, but are not present across most of the range of the Queen Charlotte goshawk (Nagorsen 2002, pp. 92–96; Nagorsen 2005, pp. 89). Ground squirrels (*Spermophilus* spp.) are similarly missing (Nagorsen 2002, pp. 106–109; Nagorsen 2005). American robins (*Turdus migratorius*) use open habitats including clearcuts within the range of the Queen Charlotte goshawk, but Lewis (2001, pp. 113) found that robins made up only three percent of prey deliveries at nests in Southeast Alaska, even where timber harvest was heaviest.

Because Queen Charlotte goshawks rely primarily on forest-dwelling prey, adequate amounts of suitable forest cover appear to be critical (Doyle 2006, pp. 138–139; Doyle 2007, p. 2; Doyle and Mahon, 2003, p. 1). Iverson *et al.* (1996, p. 66) believed that goshawks likely require some unknown amount of productive old-growth forest at large spatial scales (e.g., greater than 10,000 ac (4,000 ha)), and that below that level goshawk abundance would decline. Doyle (2005, p. 14) investigated known goshawk territories on the Queen Charlotte Islands, and found that all contained at least 41 percent mature and old-growth forest, although only 4 territories (each containing at least 60 percent mature and old-growth forest) were successful during the preceding 3-year period (2002–2004). Doyle (2005, pp. 13–19) used these observations to estimate the number of potential territories that could support nesting goshawks on the Queen Charlotte Islands. (See also Doyle and Holt (2005, pp. 2.5-3 to 2.5-5) for further development of this model).

Percentages of the landscape in forest cover have also been used to define habitat quality in Finland (Byholm and Kekkonen 2008, pp. 1696–1700). Several studies of northern goshawk habitat elsewhere in western North America suggest that landscapes with 40 to 60 percent mature or old forest are either favored by goshawks for nesting and foraging, or should be maintained to support goshawks (Reynolds *et al.* 1992, p. 27; Patla 1997, pp. 71–72; Finn *et al.* 2002, pp. 434–435, Doyle 2005, pp. 12–18; reviewed by USFWS 1997, pp. 36–38).

Given these observations, we consider landscapes with less than 40 percent cover by mature and old-growth forest to be low-quality habitat, and those with greater than 40 percent mature and old-growth forest high-quality habitat. Some Queen Charlotte goshawk territories likely include less than 40 percent mature forest (Iverson *et al.* 1996, p. 55), so we do not consider this criterion an absolute minimum. The true minimum likely varies depending on other factors such as prey diversity and density. There is evidence, however, that Queen Charlotte goshawks are particularly sensitive to loss of mature forest because of a lack of prey adapted to open habitats (Doyle 2006, pp. 138–139, Doyle and Mahon 2003, p. 1). While uncertainty remains over how much mature and old forest is required to maintain productive goshawk nesting and foraging habitat, we consider a standard incorporating the proportion of the landscape in mature and old forest appropriate, and, based on the best available information, 40 percent a reasonable standard.

Productive forest (capable of producing commercially viable timber) covers approximately 52 percent of the 42-million-acre (17-million-hectare) Coast Forest Region delineated by the British Columbia Ministry of Forests and Range, which approximates the range of the Queen Charlotte goshawk in Canada (USFWS 2010, Table A-20). Therefore, on average, habitat was probably high quality for goshawks (greater than 40 percent mature and old growth) prior to wide-scale timber harvest, although some areas would have been, and remain, unsuitable (e.g., large alpine areas), while other areas had extensive tracts of high-quality habitat before logging began.

Industrial-scale logging began in the coastal rainforests of British Columbia in the early 1900s, peaked in the 1980s, and has remained relatively high since then (USFWS 2007, pp. 89–90). By 2002, timber harvest had converted approximately 7.9 million ac (3.2 million ha) (36 percent) of the 21 million ac (8.8 million ha) of productive forest in coastal British Columbia to second growth. This has reduced mature and old forest cover to approximately 37 percent of the landscape (USFWS 2010, Table A-20). This percentage translates, on average, to low-quality habitat (less than 40 percent cover by mature and old-growth forest). Again, naturally nonforested areas have always been unsuitable or low-quality habitat. Alpine areas (i.e., above timberline), for example, cover 19 percent of the landscape. Below timberline, approximately 46 percent of the landscape supports mature and old forest (USFWS 2010, Table A-20), so habitat as of 2002 (the most recent rangewide data available) appears to be suitable, on

average, despite declines from historic levels. We do not know how much has been harvested since 2002, but we expect that old forest cover has been reduced by several percentage points since then.

Habitat modeling developed by the NGRT suggests that British Columbia supported approximately 1,060 suitable goshawk territories prior to initiation of industrial logging. Currently, the model predicts habitat capability of 708 territories, a 33 percent decline (Smith and Sutherland 2008, pp. 22, 29, 33, 65).

More than 100 new protected areas totaling approximately 3 million ac (1.2 million ha) were established on the British Columbia mainland coast in 2006 (BCMAL 2006, p. 1). This was followed by a December 2007 land use agreement between the Province of British Columbia and the Haida Nation, designating new protected areas totaling 628,000 ac (254,000 ha) on the Queen Charlotte Islands (BCOP 2007, pp. 1–2).

In March, 2009, the British Columbia Ministry of Agriculture and Lands announced an agreement with a broad range of stakeholders to designate protected areas and development lands across the coastal mainland, now known as the “Great Bear Rainforest.” Within this area, approximately 5.7 million ac (2.3 million ha) are now protected from logging (Armstrong 2009, pp. 4, 29; BCMAL 2009, pp. 1–2). An additional land use class, “Biodiversity, Tourism and Mining Areas,” covering approximately 741,000 ac (300,000 ha) where commercial

forestry is now prohibited, was also announced in 2009. We estimate that protected areas include approximately 2.9 million ac (1.2 million ha) of productive forest (USFWS 2010, Table A-19 and Table A-23). These estimates are based largely on the Ministry of Forest and Range's evaluation of proposed protected areas in 2002, which were similar, but not identical, to areas finally designated in 2007 (Niemann 2006, p. 1). These are the best available data on forest cover in the protected areas that we are aware of.

Future timber harvest in three of the seven Forest Districts in the Coast Forest Region (North Coast, Central Coast, and Queen Charlotte Islands Districts) will be planned using "Ecosystem Based Management," which is intended to support a sustainable economy while protecting a healthy ecosystem. No specifics on how timber harvests will change have been released (BCMAL 2006, pp. 2–3; BCOP 2007, pp. 1–2, BC 2008, p. 1). In the absence of any details about implementation of this management scheme, we rely on data and projections based on existing management practices (summarized in USFWS 2007, pp. 82–101; USFWS 2010, Tables A-1 to A-24; NGRT 2008, pp. 6–23; see also *Southwest Center for Biological Diversity v. Babbitt*, 939 F.Supp. 49 (D.D.C. 1996)).

Based on our updated analyses, we estimate that approximately 5.2 million ac (2.1 million ha) of the remaining old growth forest are likely to be harvested in British Columbia (USFWS 2010, Table A-9). We predict that this would result in



a landscape with only 26 percent coverage by mature second growth and old forest. If we disregard alpine areas, mature and old forest would cover 32 percent of the area below timberline (USFWS 2010, Table A-24). In either case, we expect this to be low-quality habitat (i.e., less than 40 percent mature and old forest).

There are many policies and land use restrictions available to facilitate conservation of goshawks and other non-timber values within the areas otherwise open to timber harvest. These regulations governing timber harvest, and other emerging land management tools and techniques, are discussed below, under “Factor D—Inadequacy of Regulatory Mechanisms.” Future harvest levels and rates (amounts, methods, and timing) are uncertain, but additional conversion of old-growth forest to second growth is expected to continue throughout the DPS.

For the purposes of evaluating threats and recovery strategies, the NGRT has divided the British Columbia range of the Queen Charlotte goshawk into four Conservation Regions: Haida Gwaii (Queen Charlotte Islands), Vancouver Island, North Coast, and South Coast (NGRT 2008, pp. 4–6). They reviewed the best-available scientific information and, where data were unavailable, used expert opinion and data-derived estimates (NGRT 2008, p. 16). They consider threats to the goshawk from habitat loss and fragmentation to be low to moderate in the North Coast region, moderate in the South Coast region, and moderate to high on the Queen Charlotte Islands and Vancouver Island (NGRT 2008, pp. 16–17).

These conclusions are consistent with our understanding of the habitat threats faced by goshawks in British Columbia.

Timber harvests in coastal British Columbia are currently composed of a mix of old growth and mature second growth. Approximately 35 percent of the harvest is currently from second growth. This percentage is expected to increase as old growth available for harvest is cut. Our review of Timber Supply Analysis Reports for Timber Sale Areas and Tree Farm Licenses indicates that within two to seven decades (time varying by individual timber tenure), currently available old growth on the mainland and Vancouver Island will be liquidated and timber harvests will be almost entirely from second growth (reviewed in USFWS 2007, pp. 89–91 and USFWS 2010, Table A-1). As a result, within 50 years only a few timber tenures are likely to have substantial reserves of old growth remaining within their timber harvesting land bases, and timber harvests across the region will likely be composed primarily of second growth. On the Queen Charlotte Islands, this is expected to take up to 12 decades (USFWS 2010, Table A-1).

We expect the amount of suitable goshawk habitat to continue to decline until all the old growth available for harvest has been converted to second growth. At that time, we expect the amount of habitat to stabilize, with less habitat than is available today. Thereafter, logging will be limited to the second growth, which we expect will be harvested on a sustained-yield basis. Because second-growth stands provide suitable goshawk habitat for only the final 10 to 20 percent of each

timber harvest rotation (reviewed in USFWS 2007, pp. 62–67), we estimate that approximately 15 percent of the second growth will be mature, at any given time, and will provide suitable nesting and foraging habitat, while 85 percent will be younger, and provide largely unsuitable habitat (USFWS 2007, pp. 99 and 131). This percentage is likely to vary over time and space, depending largely on how uniformly harvests are conducted.

It is likely that some of the mature second growth will provide little value as either nesting or foraging habitat because, for example, it is in small fragments and surrounded by low-value second growth. It is also likely that some of the younger second growth will provide foraging and perhaps nesting opportunities. We do not know precisely how these variations might balance each other, but have based our estimate of 15 percent of the harvested landscape offering suitable habitat on the best available information. We assume that most of the remaining, unharvested old growth will also provide suitable goshawk habitat, except where it is in small, isolated fragments surrounded by unforested areas.

Wildlife populations typically continue to decline for several generations after habitat loss has occurred, as the populations reach equilibrium with their habitat and competitors (Tilman *et al.* 1994, pp. 65–66). Therefore, extinction may occur many years after habitat loss has ceased.

In summary, although new protected areas should help conserve some of

the remaining goshawk habitat, significant degradation has occurred, and we expect continued decline in habitat quality within the range of the British Columbia DPS as old-growth forest available for harvest is converted to second growth. Mature second growth does provide suitable nesting and foraging habitat, but in commercially harvested landscapes, typically only a small percentage of the second growth exists in this age class, as it is typically harvested as it reaches economic maturity. Efforts are underway to modify timber harvest practices to reduce impacts on goshawks and other species (discussed below under Factor D), but we expect that most of the harvested landscape is likely to become low-quality habitat. Reductions in prey populations and loss of perches and hunting cover are likely to have increasingly negative effects on goshawks' ability to hunt prey and feed their young. Based on the best available information, we conclude that habitat loss is likely to contribute substantially to loss of long-term viability of Queen Charlotte goshawks in British Columbia. Therefore, we conclude that continued loss of habitat is likely to be a significant threat to the British Columbia DPS in the foreseeable future.

#### Factor B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

In Canada, *A. g. laingi* has been federally listed as “Threatened” under the Species at Risk Act since 2002 (51 Eliz. II, Ch. 29). British Columbia has included the subspecies on its “Red List,” as a candidate for “Threatened” or

“Endangered” status, since 1994 (Cooper and Stevens 2000, pp. 3 and 14). In 2004, British Columbia recognized that, as a Schedule 1 Species at Risk, the Queen Charlotte goshawk, along with other named species, could be affected by forest management and required protection in addition to that provided by general forest management regulations (BCMSRM 2002, pp. 1–2; Barisoff 2004, p. 2; reviewed by USFWS 2007, pp. 11–12). Each of these designations provides some protection from direct take. For example, capture of Queen Charlotte goshawks has been banned since 1994, when the subspecies was added to the provincial Red List (see “Factor D. Inadequacy of Regulatory Mechanisms” for further discussion). Take of wild birds for falconry, therefore, is not a threat to the population. Further, the northern goshawk is listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The database in which CITES trade is documented, the World Conservation Monitoring Centre (WCMC) CITES Trade Database, does not, for the most part, collect trade data at the subspecies level, and there are no CITES trade data available for the Queen Charlotte goshawk subspecies. However, as a Party to CITES, Canada must ensure that trade in northern goshawks, including the Queen Charlotte goshawk subspecies, does not adversely affect the species.

Although individual Queen Charlotte goshawks may be killed or captured illegally on occasion, we have no indication that such activity is common, or that it poses any threat to the subspecies. We do not expect overutilization for commercial, recreational, scientific, or educational purposes to contribute to

population declines or extinction risk. The NGRT considers the threat of human persecution to be low to none (NGRT 2008, pp. 17 and 21). We conclude that overutilization for commercial, recreational, scientific, or educational purposes does not now, or in the foreseeable future, pose a significant threat to the British Columbia DPS of the Queen Charlotte goshawk.

#### Factor C. Disease or Predation

Disease and predation associated with Queen Charlotte goshawks are not well documented, but small populations such as those on Vancouver Island and the Queen Charlotte Islands can be vulnerable to diseases, particularly when simultaneously stressed by other factors such as prey shortages. Reynolds *et al.* (2006, pp. 269–270) reviewed diseases as a potential factor limiting northern goshawk populations, and concluded that there is no strong evidence that disease limits goshawk populations. The NGRT considers the threat from disease low, but has expressed concern that emerging diseases such as West Nile virus, which is transmitted by mosquitoes and is fatal in goshawks (Wunschmann *et al.* 2005, p. 259), may be difficult to mitigate if outbreaks occur (NGRT 2008, pp. 16, 21). In 2010, the disease was detected in four American crows (*Corvus brachyrhynchos*) and one black-billed magpie (*Pica hudsonia*) in British Columbia. It was not detected in any of the 48 birds tested in British Columbia in 2011 (CDC 2012, [http://www.ccwhc.ca/wnv\\_report\\_2010.php](http://www.ccwhc.ca/wnv_report_2010.php) and [http://www.ccwhc.ca/wnv\\_report\\_2011.php](http://www.ccwhc.ca/wnv_report_2011.php), accessed 1/27/2012). No predictions

are available on when we might expect the disease to affect goshawks in British Columbia.

Predation can also suppress small populations, leaving them vulnerable to other population stress factors. Goshawk predators within the British Columbia DPS include great horned owl (*Bubo virginianus*), bald eagle (*Haliaeetus leucocephalus*), American marten (*Martes americana*), wolverine (*Gulo gulo*), and black bear (*Ursus americanus*). Raccoons (*Procyon lotor*), which could take eggs or nestlings, have also been introduced on the Queen Charlotte Islands (Golumbia *et al.* 2003, pp. 13–15). The NGRT considers predation risk low across the range of the DPS (NGRT 2008, pp. 16–20).

No information suggests that disease or predation currently put Queen Charlotte goshawks in danger of extinction in the British Columbia DPS, but either disease or predation may contribute to extinction risk in the foreseeable future if their effects are exacerbated by other population stressors such as prey shortages, habitat limitations, or unfavorable weather (which affect nesting effort). We conclude that disease and predation do not currently put the Queen Charlotte goshawk at risk of extinction, although there is moderate risk that either could affect population viability once the goshawk population has declined in response to expected habitat loss, which is anticipated to peak in approximately 50 years.

#### Factor D. Inadequacy of Existing Regulatory Mechanisms

Direct Take: Throughout Canada, the Species at Risk Act protects the Queen Charlotte goshawk from direct harm, harassment, and take on Federal lands. Individuals, eggs, and occupied nests are protected on all jurisdictions in British Columbia under the provincial Wildlife Act (RSBC 1996, section 34). Possession and trade in the subspecies is forbidden throughout Canada, as is destruction of nests. Based on the available information, regulation of direct take appears to be adequate throughout the DPS.

Habitat Protection: Two mechanisms exist to protect habitat under the Federal Species at Risk Act in Canada: (1) Identification of critical habitat, which may not be destroyed; and (2) conservation agreements, which may be negotiated with any entity or individual. Other mechanisms have been used by the Provincial government to protect goshawk habitat (discussed below), but critical habitat has not yet been formally designated under the Species at Risk Act (NGRT 2008, p. 31).

The Species at Risk Act requires development of a recovery strategy, which identifies the scientific framework for recovery. The NGRT, which includes experts from Provincial and Federal (U.S. and Canadian) government agencies, private consultants, nongovernmental organizations, industry, and First Nations, has produced a recovery strategy summarizing natural history, threats,



knowledge gaps, and recovery approach (NGRT 2008). A recovery action plan, to define and guide implementation of the recovery strategy, is anticipated, but not yet available (NGRT 2008, pp. i, 34).

The recovery strategy identifies many legal mechanisms for protecting habitat at various scales. Land use planning is perhaps the most broad-scale method used by the British Columbia Provincial Government for establishing protected areas and limits on development to conserve biodiversity across the Province. Approximately 13 percent of the landscape across coastal British Columbia is protected from logging in various parks and reserves. These reserves average approximately 50 percent cover by productive forest (USFWS 2010, Table A-23), so on average they appear to provide high-quality habitat. Special management zones, where timber harvest is allowed but non-timber values such as wildlife and recreation are given additional consideration, are also designated in some areas (BC 2000, p. 30).

Logging on Crown (Provincial) lands is regulated by the Forest and Range Practices Act (FRPA). This statute and its companion regulations set objectives for many resources, and require Forest Stewardship Plans describing how each objective will be met. The FRPA is also supported by the Identified Wildlife Management Strategy (IWM Strategy), which provides direction, policy, procedures and guidelines for managing species at risk and regionally important wildlife; the strategy addresses only forest and range practices regulated by the

FRPA. It is one fine-filter tool British Columbia uses for conservation of species at risk; it complements coarse-filter mechanisms, such as protected areas and regulations governing timber harvest generally, that manage multiple species and habitats. Wildlife Habitat Areas and associated General Wildlife Measures (legal terms) may be implemented under a FRPA regulation to protect important habitat elements (e.g., goshawk nests). The IWM Strategy provides guidance for their establishment (BCMWLAP 2004, pp. 1–4).

Where nests are identified, Wildlife Habitat Areas are proposed, usually by Provincial biologists although anyone may make a proposal. The proposed Area is reviewed and may be modified by the Ministry of Environment; comments are solicited from affected parties; a Timber Supply Impact Analysis is conducted; the proposal is reviewed by a Provincial Committee; and a final decision is made by the Ministry of Environment (BCMWLAP 2004, pp. 4–10). The final decision may reflect compromises intended to reduce impacts on timber operators or others.

Wildlife Habitat Areas designated for goshawks are designed primarily to protect a core area that supports the active nest, alternate nests, and post-fledging area. Timber harvest is generally prohibited within these core areas. Wildlife Habitat Areas for goshawks average approximately 500 acres (200 ha) although they vary in size depending on site characteristics and overlap with other special management areas such as riparian zones, old growth management areas, etc.

Prohibitions and constraints also vary among sites. For example, management plans may be developed to guide timber harvesting and road construction in the surrounding management zone to protect foraging habitat. Nonbinding recommendations have been developed to help guide these management plans (McClaren 2004, pp. 10–11). Currently there are 27 Wildlife Habitat Areas: 24 on Vancouver Island, 1 on the mainland coast, and 2 on the Queen Charlotte Islands. Ten additional reserves (not Wildlife Habitat Areas) are proposed under the draft Haida Gwaii Land Use Objectives Order, Schedule 12.

Provincial policy limits the impact of land protection under the IWM Strategy on the timber supply to one percent of the Timber Harvesting Land Base, which is the productive forest available for logging outside protected parks and other reserves. The Timber Harvesting Land Base also excludes forested areas outside reserves that are inoperable (e.g., too steep or wet to log), or retained to protect other resources (e.g., stream banks, deer winter ranges, or archaeological sites). To the extent possible, Wildlife Habitat Areas are designated on lands protected under other authorities. The one percent cap may be waived with adequate justification, and does not have legal force of law, but is considered a goal of government (BCMWLAP 2004, p. 4; FPB 2004, pp. 7–8).

The one percent cap is calculated and tracked separately for each forest district, with further limitations on the amount of mature and old forest that may be designated, using “budgets” for the short term timber supply (stands greater

than 60 years old) and long-term timber supply (stands less than 60 years old) (BCMWLAP 2004, p. 4; FPB 2004, pp. 7–8).

Another limitation of the one percent cap on goshawk conservation is apparent in areas with high numbers of other at-risk species and continuing threats to those species (Wood and Flahr 2004, pp. 394–395). Southern Vancouver Island, for example, is a biodiversity “hot spot,” with a large number of rare and endemic species (Scudder 2003, pp. 15–31). Some of these species have habitat needs that differ from those of the goshawk, yet their legitimate conservation needs are to be accommodated along with the goshawk within the one percent limit, under this policy. In the South Island Forest District, Wildlife Habitat Areas are approaching, and may have already exceeded, the one percent cap (Wood *et al.* 2003, p. 53). Other areas within the Coast region with lower levels of human impact and fewer endemic species may have greater flexibility to protect important forest stands for goshawks and other species.

Coast Land Use Orders issued in March 2009 establish legal requirements to maintain habitat for goshawks and other focal wildlife species within areas set aside for old growth retention. Across the province, there is an effort to co-locate various protection tools under the Forest and Range Practices Act to minimize impacts to timber harvests and local economies.

In 2004, the British Columbia Ministry of Sustainable Resource

Management established “Provincial Non-Spatial Old Growth Objectives” that must be addressed in Forest Stewardship Plans (Abbott 2004, pp. 1–6). The order established “Landscape Units” and old-growth-forest retention objectives for each of those units. Individual Landscape Units are assigned to low, intermediate, or high biodiversity emphasis, with lower percentages of old-growth retention identified for lower-emphasis units. The exact amount of old growth that must be retained depends on the forest type (biogeoclimatic zone) and the “natural disturbance regime” identified for each biogeoclimatic zone variant. Within the Coastal Western Hemlock (*Tsuga heterophylla*) Zone, old-growth retention objectives range from 9 to 13 percent; in the Mountain Hemlock (*T. mertensiana*) Zone, objectives range from 19 to 28 percent; and in the Coastal Douglas-fir (*Pseudotsuga menziesii*) Zone, 9 to 13 percent. The objectives are termed “nonspatial” because they describe amounts but not specific areas to be retained, unlike other orders that establish protection of specified areas. In order to meet the non-spatial, old-growth objectives, tenure-holders and Timber Supply Area managers can rely on existing protected areas such as Wildlife Habitat Areas, riparian reserves, inoperable lands, and other designations that result in retention of old-growth stands.

The Province does not maintain detailed inventories of forest resources on private lands, where there is little government oversight or regulation. For the purpose of developing a seamless forest cover inventory for the whole province, the Ministry of Forests and Range used baseline thematic mapping, based on

satellite imagery from the 1990s, and biogeographic ecosystem classification to characterize forest cover on private lands (BCMFR 2006, p. 138). Private lands are estimated to cover approximately 4.1 million ac (1.7 million ha) within the Coast region (Niemann 2006, attachment 1). Much of the private land is concentrated on the southern portions of Vancouver Island and the mainland coast.

The Province of British Columbia has made significant progress in implementation of several elements of its conservation program for goshawks, as described above. A recovery strategy has been released. Several of the actions identified in the draft strategy have begun; others are likely to be implemented once the Recovery Implementation Group completes an action plan (NGRT 2008, pp. 21–32).

To help guide evaluation of conservation efforts that are either planned but not yet implemented, or underway but not yet proven effective, the Service published a “Policy for Evaluation of Conservation Efforts When Making Listing Decisions” (PECE Policy) (68 FR 15100, March 28, 2003). The policy directs us to consider (1) the certainty that a conservation effort will be implemented, and (2) the certainty that the effort will be effective.

British Columbia’s recovery strategy identifies several broad strategies and recommended approaches to address threats to the goshawk, with specific

actions listed to address each approach (NGRT 2008, pp. 26–30). Many of the actions listed in the recovery strategy have been implemented and warrant evaluation as formalized conservation efforts. We also evaluate actions identified in the recovery strategy that have not yet been implemented, because we believe that the NGRT intends to pursue them.

Among the actions that have not yet been completed are predictions of habitat changes resulting from climate change, monitoring and modeling of West Nile Virus impacts, and monitoring of edge-adapted competitors and predators. The recovery strategy is a broad-scale document that does not provide details on who would be responsible for implementing the identified actions, the source and security of funding, legal authorities, procedural and legal requirements (permits, authorizations and permissions, etc.), and volunteer (e.g., landowner or timber tenure holder) participation necessary to implement the actions, as required for us to conclude with a high level of certainty that the actions will be implemented (PECE Policy, 68 FR 15114–15115).

Among the actions identified in the draft strategy that have already begun, the most highly developed is protection of habitat using existing authorities and mechanisms. These are described in NGRT (2008) Appendix 1, and are evaluated above. We consider habitat protection an effective strategy, but cannot conclude that implementation under existing mechanisms adequately removes the threat posed to the Queen Charlotte goshawk from habitat loss.

Other actions listed in the recovery strategy have been implemented (or have begun and are ongoing), but have not yet been proven effective. Included in this category are:

- Development of general wildlife measures to ensure sufficient foraging habitat outside Wildlife Habitat Areas,
- Landscape modeling to identify habitat availability,
- Research and implementation of silviculture methods to promote prey populations,
- Development and implementation of management plans for introduced species,
- Development and implementation of outreach and education for landowners and resource managers,
- Effectiveness monitoring of habitat management,
- Development and use of spatially explicit population models and genetic samples to define population and distribution objectives,
- Use of habitat conservation tools to conserve and recover populations in each conservation region, and
- Identification and monitoring of prey populations.

The PECE Policy lists six criteria necessary to establish that a conservation effort will be effective in adequately reducing threats to a level that listing a species as threatened or endangered is not necessary. These criteria



include (1) a description of the threats addressed by the conservation effort, (2) explicit, incremental objectives for the conservation effort and dates for achieving the objectives, (3) the steps necessary to implement the conservation effort, (4) quantifiable measures to demonstrate progress toward, and achievement of, objectives, (5) provisions for monitoring and reporting progress on implementation and effectiveness, and (6) incorporation of adaptive management principles (68 FR 15115). The recovery strategy is a broad-level planning document that describes threats to the goshawk and provides recommendations for addressing those threats. It lacks detail on implementation of the recommended actions. A recovery action plan, which will likely provide much of the detail described in the PECE Policy, is expected soon. Meanwhile, we are not aware of currently available documents that provide the information (criteria 1 through 6, immediately above) necessary to ascertain with a high level of certainty that the actions will be effective.

A major conservation effort recently announced by the Province of British Columbia is Ecosystem Based Management for lands managed for multiple uses in the Central Coast, North Coast, and Haida Gwaii regions (BCMAL 2006, pp. 1–3; BCOP 2007, pp. 1–2). Ecosystem Based Management “is a new adaptive approach to managing human activities that ensures the coexistence of healthy ecosystems and communities. The intent of ‘Ecosystem Based Management’ is to support a sustainable economy while protecting a healthy ecosystem” (BCMAL 2006, p. 2). Key elements include establishment of protected areas; higher

standards for key environmental values; use of traditional, local, and scientific knowledge to develop management targets; recognition of aboriginal and other local interests in land use planning and management; and promotion of stability, certainty, and long-term resource use (BCMAL 2006, p. 2).

The British Columbia Government has moved to implement Ecosystem Based Management on the mainland coast and, more recently, the Queen Charlotte Islands. Land use agreements have been reached with various First Nations, and efforts are underway to identify lands for protection or other management regimes. We have a high level of certainty that Ecosystem Based Management will be implemented in some form, although details are not yet available on which lands, if any, will be protected and how timber harvest will be regulated. We expect that protection of additional areas may reduce logging in some areas, although the rate of logging on the remaining lands is not known. We, therefore, cannot be sufficiently certain that the program will reduce threats to goshawks to a level that listing as threatened or endangered is no longer necessary.

Management of British Columbia's forests is currently in a period of change. This increases the uncertainties inherent in our projections of future conditions. We believe that the current trend toward policies that reduce impacts to goshawks from timber harvest will continue in the short term, as commitments made in recent land use agreements are implemented. We expect these conditions

to persist for at least 10 to 15 years. Beyond that, we expect that political and economic considerations could force reevaluations of forest management.

In summary, 13 percent (5.4 million ac, or 2.3 million ha) of the land area (42 million ac, or 17 million ha), and 13 percent (3.0 million ac, or 1.2 million ha) of the productive forest (22 million ac, or 8.8 million ha) is protected in parks and other reserves within the range of the British Columbia DPS (USFWS 2010, Table A-9 and Table A-23). Management of timber lands within the province includes retention of additional forest cover to protect various non-timber values associated with forests, including goshawks. Designations of Wildlife Habitat Areas to protect species at risk, including goshawks, however, are limited by a policy-level cap of one percent of the Timber Harvesting Land Base. We acknowledge that much work is underway in the Province to address the threats and conservation needs of Queen Charlotte goshawks. Because much of the regulatory framework is relatively new, some key elements of the recovery effort have not yet been fully developed or implemented, so it is difficult at this time to assess their potential effectiveness (see *Evaluation of Conservation Efforts*, below).

We conclude that continued development and implementation of regulatory mechanisms will be required to minimize the risk of extinction for the British Columbia DPS of the Queen Charlotte goshawk. Existing regulatory mechanisms do not appear to adequately reduce the threat posed to goshawk

habitat from timber harvest. Consequently, we conclude that inadequacy of regulatory mechanisms is a threat to the Queen Charlotte goshawk in the foreseeable future.

*Factor E. Other Natural or Manmade Factors Affecting the Species' Continued Existence*

*Competition for prey or nest sites:* We are not aware of current population-level threats to Queen Charlotte goshawks due to competition for either prey or nest sites. The NGRT rates this threat as low across the DPS (NGRT 2008, p. 16). Competition among herbivores has been implicated in grouse declines on the Queen Charlotte Islands where introduced deer have reportedly overbrowsed blueberries and other important grouse foods, resulting in grouse population declines (Golumbia *et al.* 2003, pp. 10–11; Doyle 2004, pp. 15–16). This has probably reduced goshawk nesting effort (number of pairs attempting to nest) on the Queen Charlotte Islands during periods of low squirrel density, when goshawks might otherwise have nested if grouse had been more abundant. Predation on sooty grouse eggs and nestlings by introduced raccoons may also be a factor contributing to grouse population declines on the Queen Charlotte Islands (Golumbia *et al.* 2003, pp. 13–15). We expect this condition to persist indefinitely, unless deer or raccoons are eliminated or reduced by some action or agent.

*Prey Diversity:* Prey choices are limited within the range of the Queen Charlotte goshawk. Red squirrels, sooty grouse, and a variety of smaller forest birds form much of the diet (Ethier 1999, pp. 21–22 and 32–47; Lewis 2001, pp. 81–107; Lewis *et al.* 2004, pp. 378–382; Doyle 2005, pp. 30–31). Squirrel and sooty grouse populations fluctuate (Doyle 2004, p. 5; Doyle 2007, p. 2), forcing goshawks to switch to alternate prey during times of low squirrel and grouse populations. Species that are commonly taken by goshawks in areas adjacent to coastal British Columbia are missing from much of the Queen Charlotte goshawk’s range. For example, snowshoe hares are limited to portions of the mainland, where they are considered rare (Nagorsen 2002, pp. 92–93; Nagorsen 2005, p. 89). Ground squirrels (*Spermophilus parryii*) are also limited to the mainland, but are missing from rainforest habitats along the coast (Nagorsen 2002, pp. 106–109). Cottontail rabbits (*Sylvilagus floridans*) have been introduced to southern Vancouver Island, but are not widespread and have not been documented in goshawk diets there. The Queen Charlotte Islands generally have lower diversity of prey than either the mainland or Vancouver Island, so the NGRT considers threats due to low prey diversity low on the mainland, moderate on Vancouver Island, and high on the Queen Charlotte Islands (NGRT 2008, pp. 16, 18).

Additional species could be introduced, or colonize the region, particularly if climate change (discussed below) alters habitat conditions, which could potentially benefit goshawks. However, we have very limited ability to reliably

predict the timing of any changes in prey communities. We believe, therefore, that low prey diversity will remain a localized stressor likely to act in combination with other threats such that Queen Charlotte goshawks become in danger of extinction in the foreseeable future in some areas of the DPS.

*Contaminants:* We know of no contaminants that pose current or potential future threats to goshawks within the British Columbia DPS.

*Natural disasters and catastrophic events:* Natural disasters such as windstorms, landslides, avalanches, earthquakes, tsunamis, and volcanic eruptions could affect localized areas within the British Columbia DPS, but are not believed to pose population-level threats, either now or in the foreseeable future. Large, landscape-altering forest fires, insect infestations, or tree diseases could pose population-level threats to Queen Charlotte goshawks in the British Columbia DPS if they affect major portions of the DPS. The likelihood that any of these occurrences would be of such magnitude, however, is unknown. While fires, insect infestations and forest disease epidemics are likely to occur in the foreseeable future, we cannot reliably predict that the magnitude of these events is likely to be great enough to exert population-level effects. Therefore, we cannot conclude that they pose threats in the foreseeable future.

*Climate Change:* “Climate” refers to an area's long-term average weather statistics (typically for at least 20- or 30-year periods), including the mean and

variation of surface variables such as temperature, precipitation, and wind; “climate change” refers to a change in the mean or variability or both of climate properties that persists for an extended period (typically decades or longer), whether due to natural processes or human activity (Intergovernmental Panel on Climate Change (IPCC) 2007a, p. 78). Although changes in climate occur continuously over geological time, changes are now occurring at an accelerated rate. For example, at continental, regional, and ocean basin scales, recent observed changes in long-term trends include: A substantial increase in precipitation in eastern parts of North America and South America, northern Europe, and northern and central Asia, and an increase in intense tropical cyclone activity in the North Atlantic since about 1970 (IPCC 2007a, p. 30); and an increase in annual average temperature of more than 2 °Fahrenheit (1.1 °Celsius) across the United States since 1960 (Global Climate Change Impacts in the United States (GCCIOUS) 2009, p. 27). Examples of observed changes in the physical environment include: An increase in global average sea level, and declines in mountain glaciers and average snow cover in both the northern and southern hemispheres (IPCC 2007a, p. 30); substantial and accelerating reductions in Arctic sea-ice (e.g., Comiso *et al.* 2008, p. 1); and a variety of changes in ecosystem processes, the distribution of species, and the timing of seasonal events (e.g., GCCIOUS 2009, pp. 79–88).

The IPCC used Atmosphere-Ocean General Circulation Models and various greenhouse gas emissions scenarios to make projections of climate change

globally and for broad regions through the 21<sup>st</sup> century (Meehl *et al.* 2007, p. 753; Randall *et al.* 2007, pp. 596–599), and reported these projections using a framework for characterizing certainty (Solomon *et al.* 2007, pp. 22–23). Examples include: (1) It is virtually certain there will be warmer and more frequent hot days and nights over most of the earth's land areas; (2) it is very likely there will be increased frequency of warm spells and heat waves over most land areas, and the frequency of heavy precipitation events will increase over most areas; and (3) it is likely that increases will occur in the incidence of extreme high sea level (excludes tsunamis), intense tropical cyclone activity, and the area affected by droughts (IPCC 2007b, p. 8, Table SPM.2). More recent analyses using a different global model and comparing other emissions scenarios resulted in similar projections of global temperature change across the different approaches (Prinn *et al.* 2011, pp. 527, 529).

All models (not just those involving climate change) have some uncertainty associated with projections due to assumptions used, data available, and features of the models; with regard to climate change this includes factors such as assumptions related to emissions scenarios, internal climate variability, and differences among models. Despite this, however, under all global models and emissions scenarios, the overall projected trajectory of surface air temperature is one of increased warming compared to current conditions (Meehl *et al.* 2007, p. 762; Prinn *et al.* 2011, p. 527). Climate models, emissions scenarios, and associated assumptions, data, and analytical techniques will continue to be



refined, as will interpretations of projections, as more information becomes available. For instance, some changes in conditions are occurring more rapidly than initially projected, such as melting of Arctic sea-ice (Comiso *et al.* 2008, p. 1; Polyak *et al.* 2010, p. 1797), and since 2000 the observed emissions of greenhouse gases, which are a key influence on climate change, have been occurring at the mid- to higher levels of the various emissions scenarios developed in the late 1990's and used by the IPCC for making projections (e.g., Raupach *et al.* 2007, Figure 1, p. 10289; Manning *et al.* 2010, Figure 1, p. 377; Pielke *et al.* 2008, entire). Also, the best scientific and commercial data available indicate that average global surface air temperature is increasing and several climate-related changes are occurring and will continue for many decades even if emissions are stabilized soon (e.g., Meehl *et al.* 2007, pp. 822–829; Church *et al.* 2010, pp. 411–412; Gillett *et al.* 2011, entire).

Changes in climate can have a variety of direct and indirect impacts on species, and can exacerbate the effects of other threats. Rather than assessing “climate change” as a single threat in and of itself, we examine the potential consequences to species and their habitats that arise from changes in environmental conditions associated with various aspects of climate change. For example, climate-related changes to habitats, predator-prey relationships, disease and disease vectors, or conditions that exceed the physiological tolerances of a species, occurring individually or in combination, may affect the status of a species. Vulnerability to climate change impacts is a function of sensitivity to

those changes, exposure to those changes, and adaptive capacity (IPCC 2007, p. 89; Glick *et al.* 2011, pp. 19–22). As described above, in evaluating the status of a species, the Service uses the best scientific and commercial data available, and this includes consideration of direct and indirect effects of climate change. As is the case with all potential threats, if a species is currently affected or is expected to be affected by one or more climate-related impacts, this does not necessarily mean the species should be listed as an endangered or threatened species as defined under the Act. If a species is listed as endangered or threatened, this knowledge regarding its vulnerability to, and impacts from, climate-associated changes in environmental conditions can be used to help devise appropriate strategies for its recovery.

While projections from global climate model simulations are informative and in some cases the only or the best scientific information available, various downscaling methods are being used to provide higher-resolution projections that are more relevant to the spatial scales used to assess impacts to a given species (see Glick *et al.* 2011, pp. 58–61). With regard to the area of analysis for the Queen Charlotte goshawk, we are not aware of downscaled projections for coastal British Columbia. In adjacent Southeast Alaska, we expect warmer, wetter conditions that will likely favor increased forest cover. More of the annual precipitation is likely to be rain, rather than snow, and spring runoff is likely to be earlier than it currently is (Kelly *et al.* 2007, pp. 31–42).

The mean number of frost days is predicted to be particularly sensitive in coastal British Columbia and Southeast Alaska, where the National Center for Atmospheric Research's Parallel Climate Model predicts 50 to 70 fewer frost days per year by 2080 to 2099 (Meehl et al. 2004, p. 498). We expect this trend to encourage encroachment of forest into alpine areas and to accelerate growth of trees in currently forested areas (Hamann and Wang 2006, pp. 2780–2782). This trend is likely to improve habitat conditions for goshawks.

Gains of forest habitat from climate change could be offset, to an unknown degree, by decreases in forest cover as a result of increases in the frequency and severity of large fires, forest pests, or forest diseases (Bachelet *et al.* 2005, pp. 2244–2248). Increases in severe weather events, which are predicted to occur, could have localized effects, impacting nesting effort and productivity, which appear to be sensitive to spring weather (Fairhurst and Bechard 2005, pp. 231–232; Finn *et al.* 1998, p. 1; Patla 1997, pp. 34–35; McClaren *et al.* 2002, p. 350).

Another potential threat related to climate change is increased competition from the mainland form of the goshawk (*A. g. atricapillus*). This threat is difficult to assess, as we are uncertain of the adaptive advantages conferred by the two phenotypes. Changes in prey communities might also occur. Again, it is unclear if such changes would favor one subspecies over the other.

We conclude that climate change is likely to have mixed effects on goshawks. Landscape-level changes due to climate change are likely, and some of these changes could negatively affect the British Columbia DPS of the Queen Charlotte goshawk. We do not believe that such changes currently place the DPS in danger of extinction, nor, based on climate models that project out approximately 100 years, do we expect them to in the foreseeable future.

*Demographic Considerations:* The small goshawk population on the Queen Charlotte Islands appears to be genetically distinct from goshawks elsewhere and may be genetically isolated (Gust et al. 2003, p. 22; Talbot *et al.* 2005, pp. 2–3; Talbot 2006, p. 1, Talbot *et al.*, *in press*). Isolated populations such as the one on the Queen Charlotte Islands are typically at greater risk of extinction or genetic problems such as inbreeding depression and loss of genetic diversity, particularly where populations are small (Lande 1988, pp. 1456–1457; Frankham *et al.* 2002, pp. 312–317). Inbreeding depression is a reduction in viability and fecundity that occurs as large populations decline and rapid inbreeding produces increased prevalence of harmful genes that are typically rare in larger populations (Lande 1988, p. 1456). Loss of genetic diversity occurs as populations are reduced, and can diminish future adaptability to a changing environment.

Effects of low genetic diversity can be minimized through actions such as carefully planned captive breeding and translocations among wild and/or captive populations. The NGRT considers threats from genetic isolation to be high for the

Queen Charlotte Islands, and low to none elsewhere in British Columbia (NGRT 2008, pp. 16, 18–19). We concur with this assessment. We believe that the greatest threats from inbreeding depression or other impacts associated with low genetic diversity would come as populations adjust to reduced habitat availability, which we believe will be lowest in about 120 years on the Queen Charlotte Islands, and in about 50 years for the rest of the DPS, when conversion of available old growth to second growth forest will be nearly complete (except on a few timber tenures), and timber harvests will be composed primarily of second growth (see discussion under *Factor A*, above).

Hybridization can be a threat when related species or subspecies interbreed, diluting the genetics of the smaller population. Populations on Vancouver Island apparently display genetic affinities with the subspecies of goshawk that inhabits much of mainland North America, *Accipiter gentilis atricapillus* (Gust *et al.* 2003, p. 22; Talbot *et al.* 2005, pp. 2–3; Talbot 2006, p. 1, Talbot *et al.* 2011, p. 27).

A cline is a gradation in a measurable characteristic across a geographic area. Such variation is typically believed to reflect a species' response to variation in an environmental variable, and may result in development of distinct species or subspecies (Endeler 1977, pp. 5–7). Such clinal variation has been noted in body size of goshawks, with North America's smallest goshawks on Vancouver Island and larger birds through Southeast Alaska to the north and through western

United States and Canada to the south and east (Whaley and White 1994, pp. 179–187, 193; Flatten *et al.* 2002, p. 2; Flatten and McClaren 2003, p. 1). These observations suggest that if body size is genetically controlled, hybridization that may be occurring among goshawks on Vancouver Island has not overwhelmed the expression of small body size that we believe could be an adaptation to prey and habitat limitations.

On the mainland, the Queen Charlotte goshawk (*A. g. laingi*) inhabits wet coastal forests, but likely interbreeds with the interior subspecies (*A. g. atricapillus*) within the drier coastal western hemlock zones between coastal and interior forests. The NGRT considers this a transition zone between the two subspecies, where genetic delineations will likely be blurred (NGRT 2008, pp. 3, 6, and 18).

Goshawks are highly mobile, and sometimes use different nesting areas in subsequent years (Flatten *et al.* 2001, pp. 9–14; Lewis and Flatten 2004, p. 2). This characteristic likely increases genetic diversity. Following the breeding season, females often leave their breeding territory, while males apparently stay within and adjacent to the nesting area in most but not all cases (Flatten *et al.*, 2001, pp. 9–14; Lewis and Flatten 2004, p. 2; Iverson *et al.* 1996, pp. 28–29). Lewis and Flatten (2004, p. 2) documented a radio-tagged male in Southeast Alaska that moved greater than 50 mi (80 km) following its nesting season, and a female that moved greater than 27 mi (44 km) and returned to its nesting area

during the breeding season.

Transition zones between *laingi* and *atricapillus* forms have not been well sampled, so we have no information indicating whether *A. g. atricapillus* goshawks are expanding into the range of the Queen Charlotte goshawk. We recognize that range boundaries for the subspecies are somewhat imprecise and may represent a clinal variation without a distinct demarcation in some areas. Until we have evidence that suggests otherwise, though, we consider the transition zones between the subspecies to be stable. We recognize, however, that hybridization may be occurring in some areas, notably Vancouver Island and on the mainland. We conclude that hybridization could pose a risk to the subspecies in some areas, but it does not rise to the level that places the species in danger of extinction. We expect this threat to be greatest as climate changes over the next 50 to 100 years.

Population estimates for Queen Charlotte goshawks are imprecise because the birds are difficult to census. They are often secretive, and spread at low densities across forested landscapes. Survival and recruitment rates are also difficult to measure. The best available population estimates are based on estimates of habitat capability (the number of territories that can be supported by the available habitat), which is adjusted to reflect annual occupancy rates. Using such techniques, the NGRT estimated the breeding population across the British Columbia DPS to be about 352 to 374 pairs (NGRT 2008, p. 8). Small

populations such as this are at greater risk of extinction than larger populations from environmental stochasticity (random or otherwise unpredictable events such as disease epidemics, prey population crashes, or environmental catastrophes), which can reduce the population to a density at which it is vulnerable to demographic stochasticity (fluctuations in birth and mortality rates) (Engen *et al.* 2001, p. 794; Adler and Drake, 2008, p. 192). By definition, stochastic events are not predictable, so we are unable to say when we expect such threats to occur. We do believe, though, that such events are likely to occur occasionally over the next 50 to 100 years.

We conclude that the British Columbia DPS of the Queen Charlotte goshawk is not currently in danger of extinction due to other natural and manmade factors (Factor E) such as competition, contaminants, natural disasters, climate change, or genetic problems resulting from hybridization or isolation. However, due to its small population size and limited prey diversity, this DPS is likely to be vulnerable to prey fluctuations, and could face threats from hybridization (on Vancouver Island or the mainland), or inbreeding depression (on the Queen Charlotte Islands) in the foreseeable future. Each of these potential threats would likely become more important if habitat modification causes population declines, exacerbating the impact of the threats.

### *Summary of Factors*



In summary, we believe that continued habitat loss from logging (Factor A) will result in declines of prey populations and foraging habitat, and place the Queen Charlotte goshawk at risk of extinction in the foreseeable future. We do not expect overutilization for commercial, recreational, scientific, or educational purposes (Factor B) to contribute to population declines or extinction risk. We do not believe that disease and predation (Factor C) currently place the Queen Charlotte goshawk at risk of extinction, although there is moderate risk that either could affect population viability once the goshawk population has declined in response to expected habitat loss, which is anticipated to peak in approximately 50 years. Continued development and implementation of regulatory mechanisms (Factor D) will be required to eliminate the long-term risk of extinction for the British Columbia DPS of the Queen Charlotte goshawk. No other natural and manmade factors such as competition, contaminants, natural disasters, climate change, or genetic problems resulting from hybridization or isolation (Factor E) appear to rise to a level that places the goshawk in danger of extinction at this time. Due to its small population size and limited prey diversity, however, this DPS is likely to be vulnerable to prey fluctuations, and could face threats from hybridization or inbreeding depression. If habitat modification causes population declines, then prey fluctuations, hybridization, or inbreeding depression could have substantially greater influence.

#### *Determination*

As required by the Act, we considered each of the five factors under section 4(a)(1)(A) in assessing whether the Queen Charlotte goshawk is endangered or threatened throughout all or a significant portion of its range. We carefully examined the best scientific and commercial information available regarding the past, present, and future threats faced by the Queen Charlotte goshawk. We considered the information provided by the petitioners; information available in our files; other available published and unpublished information; and information submitted to the Service in response to our **Federal Register** notice of November 3, 2009.

Our analysis of threats suggests that as additional forest is logged, habitat quality will continue to decline for the British Columbia DPS of the Queen Charlotte goshawk and its prey. With reduced prey populations, and less favorable habitats in which to hunt, we expect that Queen Charlotte goshawks within the British Columbia DPS would have reduced nesting success. Ultimately, this is expected to result in even smaller populations than currently occur (best available estimate: 352 to 374 breeding pairs). It is possible that goshawks could persist in low numbers indefinitely, in spite of the expected declines in habitat quality. Smaller populations, though, likely would become increasingly vulnerable to factors such as predation, disease, prey fluctuations, hybridization, and inbreeding depression. We conclude, therefore, that although the subspecies is not in danger of extinction now, it is in danger of becoming so in the foreseeable future within the British Columbia DPS. Therefore, listing the Queen

Charlotte goshawk in British Columbia as a threatened species under the Act is warranted.

### **Significant Portions of the British Columbia DPS's Range**

The Act defines “endangered species” as any species which is “in danger of extinction throughout all or a significant portion of its range,” and “threatened species” as any species which is “likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” The definition of “species” is also relevant to this discussion. The Act defines “species” as follows: “The term ‘species’ includes any subspecies of fish or wildlife or plants, and any distinct population segment [DPS] of any species of vertebrate fish or wildlife which interbreeds when mature.” The phrase “significant portion of its range” (SPR) is not defined by the statute, and we have never addressed in our regulations: (1) The consequences of a determination that a species is either endangered or likely to become so throughout a significant portion of its range, but not throughout all of its range; or (2) what qualifies a portion of a range as “significant.”

Two recent district court decisions have addressed whether the SPR language allows the Service to list or protect less than all members of a defined “species”: *Defenders of Wildlife v. Salazar*, 729 F. Supp. 2d 1207 (D. Mont. 2010), concerning the Service’s delisting of the Northern Rocky Mountain gray

wolf (74 FR 15123, April 2, 2009); and *WildEarth Guardians v. Salazar*, 2010 U.S. Dist. LEXIS 105253 (D. Ariz. September 30, 2010), concerning the Service's 2008 finding on a petition to list the Gunnison's prairie dog (73 FR 6660, February 5, 2008). The Service had asserted in both of these determinations that it had authority, in effect, to protect under the Act only some members of a "species," as defined by the Act (i.e., species, subspecies, or DPS). Both courts ruled that the determinations were arbitrary and capricious on the grounds that this approach violated the plain and unambiguous language of the Act. The courts concluded that reading the SPR language to allow protecting only a portion of a species' range is inconsistent with the Act's definition of "species." The courts concluded that once a determination is made that a species (i.e., species, subspecies, or DPS) meets the definition of "endangered species" or "threatened species," it must be placed on the list in its entirety and the Act's protections applied consistently to all members of that species (subject to modification of protections through special rules under sections 4(d) and 10(j) of the Act).

Consistent with that interpretation, and for the purposes of this finding, we interpret the phrase "significant portion of its range" in the Act's definitions of "endangered species" and "threatened species" to provide an independent basis for listing; thus there are two situations (or factual bases) under which a species would qualify for listing: A species may be endangered or threatened throughout all of its range; or a species may be endangered or threatened in only a significant

portion of its range. If a species is in danger of extinction throughout an SPR, then that species is an “endangered species.” The same analysis applies to “threatened species.” Based on this interpretation and supported by existing case law, the consequence of finding that a species is endangered or threatened in only a significant portion of its range is that the entire species shall be listed as endangered or threatened, respectively, and the Act’s protections shall be applied across the species’ entire range.

We conclude, for the purposes of this finding, that interpreting the SPR phrase as providing an independent basis for listing is the best interpretation of the Act because it is consistent with the purposes and the plain meaning of the key definitions of the Act and with the judicial opinions that have most closely examined this issue. Having concluded that the phrase “significant portion of its range” provides an independent basis for listing and protecting the entire species, we next turn to the meaning of “significant” to determine the threshold for when such an independent basis for listing exists.

Although there are potentially many ways to determine whether a portion of a species’ range is “significant,” we conclude, for the purposes of this finding, that the significance of the portion of the range should be determined based on its biological contribution to the conservation of the species. For this reason, we describe the threshold for “significant” in terms of an increase in the risk of extinction for the species. We conclude that a biologically based definition of

“significant” best conforms to the purposes of the Act, is consistent with judicial interpretations, and best ensures species’ conservation. Thus, for the purposes of this finding, and as explained further below, a portion of the range of a species is “significant” if its contribution to the viability of the species is so important that without that portion, the species would be in danger of extinction.

We evaluate biological significance based on the principles of conservation biology using the concepts of redundancy, resiliency, and representation. *Resiliency* describes the characteristics of a species and its habitat that allow it to recover from periodic disturbance. *Redundancy* (having multiple populations distributed across the landscape) may be needed to provide a margin of safety for the species to withstand catastrophic events. *Representation* (the range of variation found in a species) ensures that the species’ adaptive capabilities are conserved. Redundancy, resiliency, and representation are not independent of each other, and some characteristic of a species or area may contribute to all three. For example, distribution across a wide variety of habitat types is an indicator of representation, but it may also indicate a broad geographic distribution contributing to redundancy (decreasing the chance that any one event affects the entire species), and the likelihood that some habitat types are less susceptible to certain threats, contributing to resiliency (the ability of the species to recover from disturbance). None of these concepts is intended to be mutually exclusive, and a portion of a species’ range may be determined to be “significant” due to its contributions under any one or more of these concepts.

For the purposes of this finding, we determine whether a portion qualifies as “significant” by asking whether *without that portion*, the representation, redundancy, or resiliency of the species would be so impaired that the species would have an increased vulnerability to threats to the point that the overall species would be in danger of extinction (i.e., would be “endangered”). Conversely, we would not consider the portion of the range at issue to be “significant” if there is sufficient resiliency, redundancy, and representation elsewhere in the species’ range that the species would not be in danger of extinction throughout its range if the population in that portion of the range in question became extirpated (extinct locally).

We recognize that this definition of “significant” (a portion of the range of a species is “significant” if its contribution to the viability of the species is so important that without that portion, the species would be in danger of extinction) establishes a threshold that is relatively high. On the one hand, given that the consequences of finding a species to be endangered or threatened in an SPR would be listing the species throughout its entire range, it is important to use a threshold for “significant” that is robust. It would not be meaningful or appropriate to establish a very low threshold whereby a portion of the range can be considered “significant” even if only a negligible increase in extinction risk would result from its loss. Because nearly any portion of a species’ range can be said to contribute some increment to a species’ viability, use of such a low

threshold would require us to impose restrictions and expend conservation resources disproportionately to conservation benefit: Listing would be rangewide, even if only a portion of the range of minor conservation importance to the species is imperiled. On the other hand, it would be inappropriate to establish a threshold for “significant” that is too high. This would be the case if the standard were, for example, that a portion of the range can be considered “significant” only if threats in that portion result in the entire species being currently endangered or threatened. Such a high bar would not give the SPR phrase independent meaning, as the Ninth Circuit held in *Defenders of Wildlife v. Norton*, 258 F.3d 1136 (9th Cir. 2001).

The definition of “significant” used in this finding carefully balances these concerns. By setting a relatively high threshold, we minimize the degree to which restrictions will be imposed or resources expended that do not contribute substantially to species conservation. But we have not set the threshold so high that the phrase “in a significant portion of its range” loses independent meaning. Specifically, we have not set the threshold as high as it was under the interpretation presented by the Service in the *Defenders* litigation. Under that interpretation, the portion of the range would have to be so important that current imperilment there would mean that the species would be *currently* imperiled everywhere. Under the definition of “significant” used in this finding, the portion of the range need not rise to such an exceptionally high level of biological significance. (We recognize that if the species is imperiled in a portion that rises



to that level of biological significance, then we should conclude that the species is in fact imperiled throughout all of its range, and that we would not need to rely on the SPR language for such a listing.) Rather, under this interpretation we ask whether the species would be endangered everywhere without that portion, *i.e.*, if that portion were completely extirpated. In other words, the portion of the range need not be so important that even the species being in danger of extinction in that portion would be sufficient to cause the species in the remainder of the range to be endangered; rather, the *complete extirpation* (in a hypothetical future) of the species in that portion would be required to cause the species in the remainder of the range to be endangered.

The range of a species can theoretically be divided into portions in an infinite number of ways. However, there is no purpose to analyzing portions of the range that have no reasonable potential to be significant or to analyzing portions of the range in which there is no reasonable potential for the species to be endangered or threatened. To identify only those portions that warrant further consideration, we determine whether there is substantial information indicating that: (1) The portions may be “significant,” *and* (2) the species may be in danger of extinction there or likely to become so within the foreseeable future.

Depending on the biology of the species, its range, and the threats it faces, it might be more efficient for us to address the significance question first or the status question first. Thus, if we determine that a portion of the range is not

“significant,” we do not need to determine whether the species is endangered or threatened there; if we determine that the species is not endangered or threatened in a portion of its range, we do not need to determine if that portion is “significant.” In practice, a key part of the determination that a species is in danger of extinction in a significant portion of its range is whether the threats are geographically concentrated in some way. If the threats to the species are essentially uniform throughout its range, no portion is likely to warrant further consideration. Moreover, if any concentration of threats to the species occurs only in portions of the species’ range that clearly would not meet the biologically based definition of “significant,” such portions will not warrant further consideration.

Below we consider the contribution of three portions of the range of the British Columbia DPS to determine if these areas are significant, as described above. Portions considered significant are then evaluated to determine if goshawks there are currently in danger of extinction (i.e., endangered) vs. likely to become in danger of extinction in the foreseeable future (i.e., threatened).

Vancouver Island: We previously found that Vancouver Island was a significant portion of the Queen Charlotte goshawk’s entire range (Response to Court, 72 FR 63128; November 8, 2007) and that it was threatened (74 FR 56757). This determination was based on the amount of habitat and proportion of the rangewide population still occurring on Vancouver Island, and the importance of

the population there to redundancy and resilience of the subspecies, rangewide.

The NGRT estimates that Vancouver Island supports 165 (44 to 47 percent) of the 352 to 374 breeding pairs within British Columbia (NGRT 2008, p. 8). Geographically, Vancouver Island covers 27 percent of the DPS's range (NGRT 2008, p. 6). Thus, although Vancouver Island comprises about a quarter of the DPS's range in British Columbia, it supports nearly half of the breeding pairs. Loss of this large percentage of the small population would clearly result in a meaningful decrease in representation, resilience, and redundancy across the DPS.

Approximately half of the original goshawk habitat remains on Vancouver Island (USFWS 2010, Table A-17). Goshawks there nest in both old-growth and mature second-growth forest. Nesting densities (as measured by mean distance between nesting areas) are higher on Vancouver Island than on the Queen Charlotte Islands or in Southeast Alaska (NGRT 2008, p. 8), suggesting that prey availability is good and other necessary resources are available. Because the remaining habitat appears to be of high quality, we believe that the habitat on Vancouver Island contributes significantly to the resiliency of the DPS, as defined above.

Goshawks on Vancouver Island appear to be genetically distinct from goshawks on the Queen Charlotte Islands, with affinities to the mainland

*atricapillus* subspecies (Talbot *et al.* 2005, pp. 2–3; Talbot 2006, p. 1, Talbot *et al.*, *in press*). While this might suggest dilution of the *laingi* genotype on Vancouver Island, it is also possible that the genetic diversity in this population, expressed as a cline, could help the subspecies respond and adapt to future environmental changes, particularly as warmer-adapted forest communities move northward in response to climate change. We conclude that the population contributes to representation and resilience.

Without Vancouver Island, the Queen Charlotte goshawk population in British Columbia would be limited to the Queen Charlotte Islands and the mainland. Overall, the population would be reduced by nearly half, and a probable source of immigrants to the mainland population would be gone. We do not have a demographic model to evaluate viability prospects for the population that would remain on the mainland and the Queen Charlotte Islands, but we expect that loss of the densest population, inhabiting the most productive habitat in the DPS, would increase extinction risk for the remaining population. Without the redundancy and resiliency of the Vancouver Island population, the DPS would likely include fewer than 200 breeding pairs (NGRT 2008, p. 8). We, therefore, expect that the DPS would be in danger of extinction, and conclude that Vancouver Island is a significant portion of the DPS's range. Having established significance, we now determine if Queen Charlotte goshawk is endangered in this significant portion of the range.

*Factor A. The Present or Threatened Destruction, Modification, or Curtailment of the Habitat or Range*

Approximately 13 percent of the landscape, but only 9 percent of the productive forest, on Vancouver Island is protected in reserves (USFWS 2010, Tables A-9 and A-23). Mature and old-growth forest currently covers approximately 42 percent of Vancouver Island (USFWS 2010, Table A-21), suggesting that habitat, on average, is adequate to support goshawks. Clearly, habitat quality varies across the island. Some areas have been heavily impacted by timber harvest or urban development, and other areas have extensive stands of mature and old-growth forest that provide higher quality habitat. These local differences are masked by calculations of forest cover across the island.

Smith and Sutherland (2008, p. 33) found that habitat on Vancouver Island could potentially support approximately 310 goshawk territories. Only 55 percent of the known goshawk territories on Vancouver Island have been occupied, on average, leading the NGRT to suggest that the island may have approximately 165 breeding pairs (2008, pp. 7–8).

We estimate that approximately 170,000 ac (418,000 ha) of old-growth forest on Vancouver Island is likely to be harvested over the next 50 years (USFWS 2010, Table A-9), resulting in a landscape with approximately 35 percent cover by mature and old-growth forest (USFWS 2010, Table A-24). We

consider this low-quality habitat, on average, although many individual territories are likely to have higher quality habitat. Although habitat loss (Factor A) does not appear to pose a threat to the goshawk population on Vancouver Island at this time, it is likely to become a significant threat within the foreseeable future. The NGRT considers threats from habitat loss and fragmentation high on Vancouver Island (NGRT 2008, p. 16). We agree with this assessment and conclude that habitat loss is a threat to the Queen Charlotte goshawk in the foreseeable future, but does not place goshawks in the Vancouver Island portion of the subspecies' range in danger of extinction at this time.

*Factor B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes*

As discussed above for the entire DPS, the Queen Charlotte goshawk is protected from direct take by several laws and regulations in British Columbia. No Queen Charlotte goshawks from Vancouver Island are used for commercial, recreational, or educational purposes, including falconry; therefore, no element of this Factor is a threat to the species, now or in the foreseeable future.

*Factor C. Disease or Predation*

Neither disease nor predation has been identified as a current threat to Queen Charlotte goshawks on Vancouver Island. As discussed above, for the

entire DPS, there is what we believe to be a low risk of disease in the future from West Nile virus or other emerging diseases, but these threats do not currently place the goshawk on Vancouver Island in danger of extinction.

*Factor D. Inadequacy of Existing Regulatory Mechanisms*

Several factors reduce the effectiveness of regulatory mechanisms on Vancouver Island, as compared to the rest of coastal British Columbia. First, a much higher percentage of the land is in private ownership (approximately 27 percent, as compared to 1 percent on the Queen Charlotte Islands and 6 percent on the mainland coast) (USFWS 2010, Table A-3). Laws and regulations intended to protect goshawk habitat in the province, notably the Forest and Range Practices Act and its associated regulations and strategies, apply primarily or exclusively to Crown lands, not private lands. This leaves a significant portion of the island without regulatory protection of important goshawk habitat.

Threats to habitat loss from urban development are also greatest in the Vancouver Island and South Coast Conservation Regions. Finally, the Vancouver Island Summary Land Use Plan (BC 2000) does not specifically address goshawk habitat, whereas land use plans for both the Queen Charlotte Islands (BC 2007, pp. 22) and the Central Coast (BCMAL 2009, not numbered) make provisions for protecting goshawk habitat. We do not believe that the somewhat higher threat posed by this lower level of regulatory oversight rises to a level that places

goshawks on Vancouver Island in danger of extinction now, but does pose risks to the population in the foreseeable future, as discussed above for the entire DPS.

*Factor E. Other Natural or Manmade Factors Affecting the Species' Continued Existence*

There is evidence that goshawks on Vancouver Island hybridize (interbreed) with the mainland (*atricapillus*) form of the northern goshawk (Gust *et al.* 2003, p. 22; Talbot *et al.* 2005, pp. 2–3; Talbot 2006, p. 1; Talbot *et al. in press*). We consider Vancouver Island a “stable hybrid zone” (Haig *et al.* 2006, p. 7), where the *laingi* phenotype will continue to be represented in the population.

We believe that climate change is likely to cause changes in habitat and possibly prey communities on Vancouver Island in the foreseeable future, as discussed above for the entire DPS. Hybridization with, and competition from, the mainland form of the goshawk (*A. g. atricapillus*) seem likely, as well. We are not certain what effects these threats may have on Queen Charlotte goshawk populations, but we do not believe that they place the subspecies in danger of extinction, now or in the foreseeable future, because we expect the small, dark phenotype to persist in the forests of Vancouver Island. Nor are we aware of any current threats from contaminants, natural disasters, or genetic problems resulting from demographic isolation. Prey fluctuations may affect the population periodically in the future, as discussed above for the entire DPS, but we do not



consider the population to be currently at risk of extinction.

We do not believe that any of the factors considered in this section place the goshawk in danger of extinction in the Vancouver Island portion of its range.

#### *Summary of Factors for Vancouver Island*

None of the threats discussed above place the Queen Charlotte goshawk in current danger of extinction. Habitat loss (Factor A), inadequacy of regulatory mechanisms (Factor D), hybridization, competition, prey fluctuations, or other climate change-induced risks (Factor E) are all chronic and, acting collectively, are likely to result in the goshawk becoming in danger of extinction in the foreseeable future. Overutilization (Factor B) and predation (Factor C) are not expected to affect the population now or in the future. Disease (Factor C) could be a factor in the future, but we judge the risk now to be relatively low. Therefore, listing the species on Vancouver Island as threatened is appropriate.

Queen Charlotte Islands: When we published our proposed rule, the Queen Charlotte Islands were believed to support about 10 to 18 breeding pairs, though few nested during poor prey years (Doyle 2005, p. 18; Doyle 2007, p. 8; McClaren 2006, p. 8; NGRT 2008, p. 8). More recent habitat modeling suggests that the Queen Charlotte Islands may currently have adequate habitat for about 65 territories (Smith and Sutherland 2008, p. 41). If we apply the observed local

territory occupancy rate of 43 percent, following the methodology of NGRT (2008, pp. 7–8), the Queen Charlotte Islands might currently support about 28 breeding pairs, or about seven percent of the estimated breeding population in British Columbia.

Currently available genetic analyses suggest that the Queen Charlotte Islands population may be unique (Talbot 2006, p. 1, Talbot *et al.* in press) and genetically isolated (Talbot *et al.* 2005, p. 3; Talbot *et al.* in press). Birds from this population are apparently more consistently dark than birds from Vancouver Island or Southeast Alaska (Taverner 1940, p. 160; Beebe 1974, p. 54; Webster 1988, pp. 46–47). We believe that this phenotype may represent adaptations favoring darker birds in the relatively dark rainforest habitat where there are few prey in open habitats, and smaller body size to maximize agility for capturing primarily avian prey, and to allow survival on smaller rations during periodic prey population declines. The strength of this phenotypic expression likely reflects genetic isolation of this population in recent time (Talbot *et al.* 2005, p. 3; Talbot *et al.* in press). This population may represent a small but possibly important pool of the genetic diversity and perhaps genetic purity (genetic coding for the small, dark phenotype) within the subspecies, contributing to the subspecies' representation and environmental resilience.

In the proposed rule, we concluded that this apparent isolation and uniqueness was adequate to consider the Queen Charlotte Islands a significant

portion of the DPS' range. Because we have modified our interpretation of the term "significant portion of the range", as described above, we no longer believe this to be the case. Despite the possible genetic uniqueness of this population, we conclude the loss of this population would not likely affect survival prospects for birds in the remainder of the DPS because there appears to be little or no gene flow from the Queen Charlotte Islands to the adjacent island and mainland populations, (Gust *et al.* 2003, p. 22; Talbot *et al.* 2005, pp. 2–3; Talbot 2006, p. 1; Talbot *et al.* in press). In addition, this population is very small. Loss of this population, therefore, is unlikely to place the remainder of the DPS in danger of extinction. While we continue to believe that the genetics of the goshawks on the Queen Charlotte Islands may be important, we conclude that the Queen Charlotte Islands do not meet our criteria as a significant portion of the DPS's range.

Mainland British Columbia: The NGRT estimates that the British Columbia coastal mainland covers 64 percent of the subspecies' geographic range in the DPS, and supports approximately half of the breeding population in the DPS (NGRT 2008, pp. 6–8). Goshawks from this portion of the range likely provide immigrants to Vancouver Island, as goshawks have been documented moving between Vancouver Island and the mainland (McClaren 2004, p. 3). The mainland could represent a potential source population, should populations on Vancouver Island decline. Loss of Queen Charlotte goshawks on the mainland would result in a significant gap in the subspecies' distribution, and a significant reduction in the resiliency and redundancy of the British Columbia DPS.

Without the mainland habitat, the Queen Charlotte goshawk population in British Columbia would be limited to the Queen Charlotte Islands and Vancouver Island. Overall, the population would be reduced by about half, and a probable source of immigrants to Vancouver Island would be gone. We do not have a demographic model to evaluate viability of the population that would remain, but we expect that loss of the mainland population would increase extinction risk for the remaining population. Without the redundancy and resiliency of the mainland population, the DPS would likely number approximately 187 to 209 breeding pairs (NGRT 2008, p. 8), which is precariously small from a conservation perspective. We expect that the DPS would probably be in danger of extinction, and conclude, therefore, that the British Columbia mainland is a significant portion of the DPS's range. Having established significance, we now determine if Queen Charlotte goshawk is endangered, rather than threatened, in this significant portion of the range.

*Factor A. The Present or Threatened Destruction, Modification, or Curtailment of the Habitat or Range*

We agree with the NGRT that threats from habitat loss and fragmentation are moderate in the southern portion of the mainland and low to moderate in the northern portion (NGRT 2008, p. 16). These threats are chronic and do not currently place goshawks on the mainland in danger of extinction. Establishment

of the Great Bear Rainforest and emergence of Ecosystem Based Management on lands available for development on the mainland appear to have reduced threats somewhat, but continued loss of old-growth habitat is likely to reduce habitat quality and contribute to population declines in the foreseeable future.

*Factor B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes*

Queen Charlotte goshawks on the mainland are protected from direct take by several laws and regulations, and not used for commercial, recreational or educational purposes, including falconry; therefore, no element of this Factor is a threat to the species, now or in the foreseeable future.

*Factor C. Disease or Predation*

Neither disease nor predation has been identified as a current threat to Queen Charlotte goshawks on the mainland. We believe that there is a low risk of disease in the future from West Nile virus or other emerging diseases, but these threats do not currently place goshawks on the mainland in danger of extinction.

*Factor D. Inadequacy of Existing Regulatory Mechanisms*

Laws and regulations that protect habitat in the province, notably the

Forest and Range Practices Act and its associated regulations and strategies, apply across the mainland range, except on the 6 percent in private ownership (USFWS 2010, Table A-3). Threats to habitat loss from urban development are greatest in the southern portion of the mainland coast, but significant protected areas occur in the northern portion. We do not believe that threats posed by inadequacies in existing regulatory mechanisms place goshawks on the mainland coast in current danger of extinction.

*Factor E. Other Natural or Manmade Factors Affecting the Species' Continued Existence*

It is likely that Queen Charlotte goshawks on the mainland encounter the mainland (*atricapillus*) subspecies of the northern goshawk, and that some hybridization occurs, although we are aware of no documentation to confirm this hypothesis. The NGRT considers the drier coastal western hemlock zones on the mainland to be transitional areas between subspecies. As on Vancouver Island, we believe these areas to be stable hybrid zones where the *laingi* form will persist unless changes in habitat favoring the *atricapillus* form occur. Such changes could conceivably be caused by factors such as climate change or timber harvest. Our current understanding of climate change effects is inadequate to allow predictions concerning competitive advantages that may result. Likewise, we are unable to conclude that timber harvest will favor one subspecies over another.

We believe that climate change is likely to cause changes in habitat and possibly prey communities on the mainland coast that could affect Queen Charlotte goshawks in ways other than favoring the *atricapillus* subspecies. Any effects these threats may have on Queen Charlotte goshawk populations are likely to be in the future, and thus do not place the subspecies in this portion of its range in danger of extinction at this time.

We are aware of no current threats from contaminants or natural disasters on the mainland. Prey fluctuations may affect the population periodically in the future, as discussed above for the entire DPS, but we do not consider the population to be currently at risk of extinction.

We do not believe that any of the factors considered in this section currently place the goshawk in danger of extinction in the mainland coast portion of its range.

#### *Summary of Factors for Mainland British Columbia*

We do not expect overutilization (Factor B), predation or disease (Factor C), inadequacy of regulatory mechanisms (Factor D), or other threats, such as climate change, competition, contaminants, natural disasters, or prey fluctuations (Factor E) to have disproportionately greater impacts on the mainland than elsewhere in the DPS's range. The NGRT considers each of these threats to be

low on the mainland, except that they consider threats from low prey availability moderate in the southern portion of the mainland (NGRT 2008, p. 16).

We do not believe that habitat loss (Factor A) or hybridization rates (Factor E) place Queen Charlotte goshawks on the mainland in current danger of extinction because these threats are of a chronic, long-term nature. Continued habitat loss, however, is likely to result in poor-quality habitat across a large portion of the mainland, leading to a progressively smaller, more vulnerable population likely to become in danger of extinction in the foreseeable future. Therefore, listing the entire DPS as threatened is warranted.

#### *Summary of “Significant Portion of the Range” Analysis*

In summary, we find that Vancouver Island and the coastal mainland of British Columbia are significant portions of the DPS’s range, but that the Queen Charlotte Islands are not, using the definition of “significant portion of the range” discussed above. Further, we find that threats to the populations on Vancouver Island and the mainland coast do not place the subspecies in these portions in danger of extinction at this time, but are likely to do so in the foreseeable future. Thus, listing the entire DPS as threatened is warranted.

#### *Determination*



In consideration of the analyses described above, we find that listing the entire British Columbia DPS of the Queen Charlotte goshawk as threatened is warranted.

### **Available Conservation Measures**

Conservation measures provided to species listed as endangered or threatened under the Act include recognition (through listing), requirements for Federal protection, and prohibitions against certain practices. Recognition through listing results in public awareness, and encourages conservation actions by Federal and State governments, private agencies and groups, and individuals.

Section 7(a) of the Act, as amended, and as implemented by regulations at 50 CFR part 402, requires Federal agencies to evaluate their actions within the United States or on the high seas, and consult with the Service with respect to any species that is proposed or listed as endangered or threatened, and with respect to its critical habitat, if any is designated. Because the British Columbia DPS of the Queen Charlotte goshawk is entirely outside the United States, and is not “on the high seas,” section 7 of the Act does not apply to this DPS. Therefore, there will be no requirement to evaluate management actions or consult with the Service. Further, we cannot designate critical habitat in foreign countries (50 CFR 424.12(h)), so we are not proposing critical habitat for the DPS.

Section 8(a) of the Act authorizes the provision of limited financial assistance for the development and management of programs that the Secretary of the Interior determines to be necessary or useful for the conservation of endangered and threatened species in foreign countries. Sections 8(b) and 8(c) of the Act authorize the Secretary to encourage conservation programs for foreign threatened and endangered species, and to provide assistance for such programs in the form of personnel and training of personnel.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to all endangered and threatened wildlife. These prohibitions, under 50 CFR 17.21 and 17.31, in part, make it illegal for any person subject to the jurisdiction of the United States to “take” (take includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt any of these) within the United States or upon the high seas; import or export; deliver, receive, carry, transport, or ship in interstate or foreign commerce in the course of commercial activity; or sell or offer for sale in interstate or foreign commerce any endangered or threatened wildlife species. It also is illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken in violation of the Act. Certain exceptions apply to agents of the Service and State conservation agencies. These prohibitions would not apply to the Queen Charlotte goshawk within the British Columbia DPS, except as they apply to import into the United States or foreign commerce.

Permits may be issued to carry out otherwise prohibited activities involving endangered and threatened wildlife species under certain circumstances. Regulations governing permits are codified at 50 CFR 17.22 for endangered species, and 17.32 for threatened species. Permits may be issued for scientific purposes, to enhance the propagation or survival of the species, and for incidental take in connection with otherwise lawful activities. In addition, permits for threatened species may be issued for zoological exhibition, educational purposes or special purposes consistent with the purposes of the Act.

## **Required Determinations**

### *Paperwork Reduction Act*

This rule does not contain any new collections of information that require approval by the Office of Management and Budget (OMB) under 44 U.S.C. 3501 et seq. The regulation will not impose new recordkeeping or reporting requirements on State or local governments, individuals, businesses, or organizations. We may not conduct or sponsor and you are not required to respond to a collection of information unless it displays a currently valid OMB control number.

### *National Environmental Policy Act*

We have determined that Environmental Assessments and Environmental Impact Statements, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Act. A notice outlining our reasons for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244).

### **References Cited**

A list of the references used to develop this rule is available at <http://www.regulations.gov> at Docket No. FWS–R7–ES–2009–0049 or upon request (see FOR FURTHER INFORMATION CONTACT).

### **Author**

The primary author of this final rule is Steve Brockmann, Juneau Fish and Wildlife Field Office, U.S. Fish and Wildlife Service (see FOR FURTHER INFORMATION CONTACT).

### **List of Subjects in 50 CFR Part 17**

Endangered and threatened species, Exports, Imports, Reporting and

recordkeeping requirements, Transportation.

## **Regulation Promulgation**

Accordingly, we amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as follows:

### **PART 17—[AMENDED]**

1. The authority citation for part 17 continues to read as follows:

AUTHORITY: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Pub. L. 99-625, 100 Stat. 3500; unless otherwise noted.

2. Amend § 17.11(h) by adding a new entry for “Goshawk, Queen Charlotte” in alphabetical order under BIRDS to the List of Endangered and Threatened Wildlife as follows:

#### **§ 17.11 Endangered and threatened wildlife.**

\* \* \* \* \*

(h) \* \* \*

Species		Historic  range	Vertebrate  population where  endangered or  threatened	Status	When  Listed	Critical  habitat	Special  rules
Common name	Scientific name						
<div>* * * * *</div> <div>BIRDS</div> <div>* * * * *</div>							
Goshawk, Queen Charlotte	<u>Accipiter gentilis laingi</u>	That portion of  British  Columbia that  includes  Vancouver  Island and its  surrounding  islands, the	British Columbia,  Canada	T	807	NA	NA

		mainland coast west of the crest of the Coast Range and adjacent islands, and the Queen Charlotte Islands					
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\* \* \* \* \*

Dated: June 26, 2012

Gregory E. Siekaniec

Acting Director, Fish and Wildlife Service

**Billing Code 4310-55**

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